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# COMMENTARIES

UPON

B O E R H A A V E's

A P H O R I S M S

CONCERNING THE

KNOWLEDGE and CURE of DISEASES.

BY

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&c. &c. &c.

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*Translated from the* LATIN.

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V O L. XII.

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M. DCC. LXXVI.





THE  
AUTHOR'S PREFACE

TO THE  
FOURTH VOLUME of this WORK,  
Printed at LEYDEN, in Quarto.

**T**HE public is here presented with a FOURTH VOLUME, which I thought, which I even promised should be the last.

But the number of observations, and the quantity of materials collected, from a constant perusal of the best Authors, made it impossible for me to comprise the remainder in that compass.

I shall endeavour to complete my undertaking with the same care which I have hitherto shewn; and hence I can easily foresee, that what remains, with the general Index, will make a volume of a proper size, and that will positively be the last.



THE  
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COMMENTARIES  
UPON  
BOERHAAVE's  
APHORISMS  
CONCERNING THE  
KNOWLEDGE and CURE of DISEASES.

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*Of a* PHTHISIS PULMONALIS.

§. 1196. **I**F an ulcer has so far eat through the substance of the lungs, as that the whole habit of the body is thereby wasted and consumed, the patient is said to labour under a Phthisis Pulmonalis, or a Pulmonary Consumption.

The word *phthisis*, which is derived from the Greek verb *φθινειν*, sometimes signifies a *corruption*, but more frequently a *consumption* or *decay*. Thus the month near its end is called *φθινων μην*; and the same term is used to express the sun declining from its meridian to its setting: for authors seem indeed to have used the word *φθισις* in a direct opposite sense to *αυξησις*, *i. e.* increase; so that they said *φθισις γινεσθαι τη σεληνη*, to express the moon's being in the wain. But these things are to be seen more at large in lexicons, &c. Physicians having remarked, that the plumpness of the body gradually decreased in an ulcer of the lungs, so that scarce any thing but skin and bones seemed to be left some time before death, they gave to this disease the name



of a *phthisis* or *consumption*. This Galen confirms: for after having said, “ A *phthisis* is an ulcer of the  
“ lungs, or chest, or fauces, attended by a cough and  
“ a slow fever, and a wasting of the body <sup>a</sup>,” he presently subjoins, “ and it receives its name *απο τῆ φθίσεως*.”

The name *φθον* was also given to this disease. Galen indeed made a distinction between these two words <sup>b</sup>: for he calls every decay and wasting of the body a *phthisis*; but would have us understand by *pthoe*, that particular decay which proceeds from an ulcer. However, in the definition of a *phthisis*, which we have just quoted, he mentions an ulcer of the lungs, &c. as the cause. But Aretæus <sup>c</sup> indeed acknowledges the forming of pus as the cause of a *phthisis*: so that he calls this disease by the names of *πυρ*, *pus*, and *φθισις*, *wasting*: but at the same time he tells us, this appellation is proper when the disorder takes its rise from an imposthume in the lungs, after a spitting of blood, or cough of long standing; but when, from an abscess being formed in the thorax or side, the lungs are corroded by the pus collected in their neighbourhood, then he would have the disease called *φθον*.

Aëtius <sup>d</sup> gives a still more confined sense to the word *phthisis*, restraining this term to signify “ an ulcer of the lungs, in consequence of a spitting of blood;” but when the lungs have been corroded and ulcerated from a very acrid catarrh, he calls this complaint *pthoe* <sup>e</sup>. He owns, nevertheless, that a *phthisis* sometimes is the consequence of a pleurisy, or a peripneumony.

Thus much may suffice concerning the name of this disease. It appears, however, that this complaint is promiscuously called *phthisis*, *pthoe*, and *tabes*; custom principally determines the force and meaning of words.

A *phthisis* therefore is a wasting of the whole habit of the body from a purulent matter: such a wasting may be caused by collections of pus residing in various parts of the body, as shall be explained in §. 1214. For this reason we add here the epithet *pulmonalis*,  
both

<sup>a</sup> Definit. Medicar. n<sup>o</sup> 260, 261. Charter. Tom. II. p. 262. <sup>b</sup> Ibid.

<sup>c</sup> De Causis et Signis Morbor. Diurnum. lib. i. cap. 8. p. 36.

<sup>d</sup> Lib. viii. cap. 75. p. 174, versa. <sup>e</sup> Ibid. cap. 57. p. 167.



§. 1197. *Of a PHTHISIS PULMONALIS.* 3

both because this is more frequent than the others, and because it often happens that the lungs are at last affected, although the disorder first took its rise from a collection of pus in some other part of the body. Three things are therefore required to constitute a phthisis pulmonalis: 1. A slow wasting of the whole body: 2. The cause of this wasting must be a depravation of the humours from a putrid cacochymia: 3. The seat of the disorder must be in the lungs.

For in a catarrh, matter is discharged from the nose, and spit up by coughing, which resembles pus both in colour, thickness, and other qualities; but the patient is not said to have a phthisis, because the body is not wasted, nor are there any symptoms of a putrid cacochymy. But yet, if the matter of the catarrh be very acrid, or the cough violent and of long continuance, the lungs may be corroded, and an ulcer formed, and thus a phthisis pulmonalis produced from a catarrh.

§. 1197. **S**UCH an ulcer may be produced by any cause capable of stopping the circulation through the lungs, so as to convert the blood into purulent matter.

From the definition just given, this is evident of course. In order for a disease to be called a *phthisis pulmonalis*, there must be a putrid cacochymia in the fluids, and the lungs must be the part affected: whatever therefore can produce this effect, may justly be called the *cause* of a phthisis pulmonalis; and that many such causes exist, the following aphorisms will shew, in which they are enumerated in order.

§. 1198. **T**HES E causes may be reduced,  
1. To that peculiar constitution of body, which disposes the person first to an hæmoptoe, and then to an ulcer of the corroded part.

A phthisis pulmonalis frequently follows an hæmoptœ; but it has also been observed to be produced without this previous complaint, as Aretæus <sup>a</sup> seems to hint, and as will appear from what we shall remark hereafter.

Fernelius <sup>b</sup> takes notice, that a great controversy has arisen among authors, Whether any one falls into a consumption without some excretion of blood? but he declares that he has seen not a few die of a slow consumption, although no bloody excretion has appeared in the whole course of the disease. The same thing is confirmed by many others who have treated of a phthisis, and I believe every physician in great practice must have seen cases of the same kind.

*Hæmoptoe*, and *hæmoptysis*, are names given by physicians to a discharge of blood from the lungs, with a cough, and a sort of rattling in the breast. Celsus gives this name to every discharge of blood from the mouth, whether it proceed from the gums, fauces, or nostrils <sup>c</sup>. Aretæus chuses to make nicer distinctions <sup>d</sup>: for when the discharge of blood proceeds from the head, palate, fauces, &c. he calls it simply *αἱμορραγία*, or *αιμορραγία*; but if it proceeds from the breast and the viscera situated there, especially the lungs and aspera arteria, then he calls it *αναγωγὴ*, because the blood in this case ascends. Trallian <sup>e</sup> also used this term to express this symptom. But as a different prognosis arises, when the blood comes from these parts, and when it comes from the lungs, the physician must be careful to make the necessary distinctions; and indeed great attention is necessary here.

If blood be brought out with a cough, it is esteemed an almost certain sign that it comes from the lungs; although this symptom may deceive. I was called to a young man, who was seized with a bleeding at the nose in his sleep; and as he lay with his head bent back, the blood, falling through the foramina of the nostrils into the fauces, excited a cough, which wa-

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<sup>a</sup> De Causis et Signis Morborum Diuturnorum, lib. i. cap. 8. p. 36.

<sup>b</sup> Patholog. lib. v. cap. 10. p. 110.

<sup>c</sup> Lib. iv. cap. 4. n<sup>o</sup> 5.

<sup>d</sup> De Causis et Signis Morborum Acutorum, lib. ii. cap. 2. p. 12.

<sup>e</sup> Lib. vii. cap. 1. p. 285.

king him, he threw up blood, which greatly terrified him, fearing he had an hæmoptoë. I immediately directed him to wash his mouth and fauces with warm water, and to sit up in bed, bending his head a little forwards. Hereupon a violent bleeding at the nose began, and continued for a whole hour; but there was no longer any cough or spitting of blood: however, he could hardly overcome the fear of an hæmoptoë, which he had conceived from this accident.

It once happened, that I myself felt a slight tickling in the fauces, and soon after brought up bloody spittle; an irritating cough succeeded, and spittle tinged with blood. Opening my mouth before a mirror in the light of the sun, I discerned on the right side near the uvula, in the fleshy palate, a small red capillary artery; the mouth of which being open, distilled a very small drop of blood nearly every second. I then easily conceived how a cough might be excited by such a drop falling on the aspera arteria: at the same time I had the evidence of my sight to shew me, that such a vessel being dilated, distilled blood by anastomosis, *i. e.* by the opening of its extreme orifice. This distillation ceased in about half an hour; and the vessel contracting by degrees, became undiscernible three hours afterwards, as it was so small, that in its natural state it did not admit red globules of blood: it has thrice happened to me since to observe the same thing in other persons. If now we reflect, that a vessel so dilated may be seated in the back part of the fleshy palate near the fauces, all the same symptoms might occur, and yet the cause not be visible to the eye.

Perhaps such cases frequently happen; and it gave me pleasure to find that Galen has remarked this: *We have often seen the blood descending in abundance from the head by the internal parts, principally of the œsophagus, and thrown up by coughing; for coming suddenly on the larynx, it excites a cough: wherefore we should be careful lest we should by mistake suppose this blood to ascend from the organs of respiration*<sup>f</sup>. For which reason he

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<sup>f</sup> Nos vero cum (sanguinem) a capite, per gurgulionis præcipue partes  
inter-



very justly admonishes us, in the same chapter, to examine carefully the inside of the mouth and the nostrils, where there is the least notion of the part from whence the blood comes which is thrown up. He observed a vomiting of blood, occasioned by a leech swallowed in water by a thirsty man: and in the case of a young man, who bled at the nose and spit blood, he discovered a leech hid in the nostrils.

Aretæus<sup>g</sup> makes the like remarks concerning blood descending from the head and palate, and occasioning a fallacious appearance of an hæmoptoë.

The ancient physicians very wisely observe, that there are three ways by which the blood may flow from the vessels of the lungs, and cause an hæmoptoë: 1. By a rupture of the vessels from some external violence; which they called *ρηξις*<sup>h</sup>: (Celsus<sup>i</sup> says it was called *ρηγμοχασμος*, a word derived from *ρηνυμι*, to break, and *χασμος*, a *hiatus* or *chasm*.) 2. By the acrimony of the fluids corroding the vessels; and this they called *διαρροισις*. 3. By a dilatation of the extreme orifices of the vessels; and this, by a very apt term, they called *ανατομοισις*. Aretæus<sup>k</sup> uses the word *αραιωσις*, to express the same thing: which word also signifies *rarefaction* and *relaxation*. Thus in Galen we frequently read of *αραιωτικα φαρμακα*, *attenuating* medicines, as opposed to those remedies which were termed *πυκνωτικα* or *condensing*.

But as both the prognostic and the cure are different in these three kinds of an hæmoptoë, it will be necessary to speak of the diagnostics of each.

1. An hæmoptoë from the first of these causes may be easily known. Thus, if a person spits blood immediately after a fall, a blow, lifting a great weight, &c. we conclude that the hæmoptoë arises from a rupture of

internas ad fauces affatim descendentem, tussiendo educi sæpenumero conspexi nus; nam subito laryngi irruens tussim movet. Quare diligenter advertere animum oportet, ne aliquando hujusmodi sanguinem ex spiritalibus organis ascendere putemus. *De Locis Affectis, Lib. iv. cap. 8. Charter. Tom. VII. p. 466.*

<sup>g</sup> De Causis et Signis Morbor. Acutor, lib. ii. cap. 2. p. 12. <sup>h</sup> Aretæus. Ibid. p. 13. Galen de usu part. lib. vii. cap. 3. Charter. Tom. IV. p. 452. <sup>i</sup> Lib. iv. cap. 4. p. 203. <sup>k</sup> Ibid.

of the vessels occasioned by a great strain upon the lungs<sup>l</sup>. There is some danger, in a sudden rupture of the larger vessels, of speedy death, from the copious discharge of blood; and many such cases have been observed by physicians. But if the person escapes this first danger, there are great hopes of a cure: "For the cure of a rupture of the vessels (says Aretæus) is the easier, because the lips of the wound touch one another<sup>m</sup>;" for when the wound is fresh in a body, in other respects sound, if all those things are done which will be mentioned, §. 1200, there may be great hopes of closing up the ruptured vessel.

2. But when it is the consequence of the vessels being corroded, the cure will be much more difficult. Aretæus well observes, *that in this case an ulcer is produced, not a wound<sup>n</sup>*. And it is very evident, that ulcers produced in the lungs, from their being corroded by acrimonious fluids, must be of more difficult cure than a recent wound from some violent cause. An hæmoptoë may be known to proceed from the vessels being corroded, if no external force has been applied; if a long irritating cough has preceded; if some pain has been felt in the inside of the thorax; if the blood be spit out in small quantities, but almost continually; or if at least the spitting of blood returns often: for when the vessels are burst, the hæmorrhage is copious, but soon stops. Bennet laid it down as a prognostic rule: "The blood flowing in large quantities at intervals, is less dangerous than that which is discharged gradually, but constantly: for a periodical discharge, altho' copious, is a sign of an anastomosis; as a constant one, issuing drop by drop, shews the vessels to be corroded<sup>o</sup>."

3. An hæmoptoë from an anastomosis, or dilatation of the mouths of the vessels, is far less dangerous: for the vessels, although dilated, are still entire, and the fluids healthy; (else an erosion of the vessels would rather

<sup>l</sup> Ibid.                    <sup>m</sup> Ibid. p. 14.

<sup>n</sup> Ulcus enim, non vulnus efficitur. *Ibid.* p. 15.

<sup>o</sup> P. 106. Tabid. Theatr.

rather ensue than an anastomosis): for as soon as the blood is able to pass through the extremities of the vessels, their dilatation decreases; and, contracting themselves by their own elasticity, they soon become too narrow to transmit the red blood any longer, but only the fluids which usually pass through them, and which are more attenuated than blood. For in a natural state, the red blood never transudes into the bronchia or air-vessels of the lungs, but only fluids secreted from the blood, which moisten and lubricate the whole internal surface of the bronchia. In the instance related a little above, it appears that the dilated vessel in the fleshy palate, which on account of the red blood contained in it was obvious to the sight, became invisible in a few hours by contracting to its usual and natural size.

Aretæus <sup>P</sup> remarks, that this kind of hæmoptoë happens to women labouring under a suppression of the menses; and that it comes on at the time when the menstrual discharge should return; and unless it be cured, frequently returns. But we shall speak of these hereafter; and then it will also appear, that the cure of such an hæmoptoë is not to be neglected, altho' it be less dangerous than the others.

But as an hæmoptoë does not end in a phthisis pulmonalis unless it cause an ulcer in the lungs, we are to consider how this is produced.

An hæmoptoë from a rupture of the vessels, is a true wound, and is attended with all the circumstances of one. These we treated of at §. 158. It was there said, at n<sup>o</sup> 1. that the wounded parts receded gradually more and more from each other. The same thing happens here: For unless a large vessel is burst, which pours out a great quantity of blood at once, the hæmoptoë begins with a spitting of but little blood; but the quantity soon increases, and afterwards decreases again; and, if the patient keeps quiet, generally ceases soon, but so as that a thin spittle tinged with red is spit out.—As, in an external wound, the lips grow red, painful, and swelled, and a slight fever comes on if the wound be considerable; thus it happens also  
to



to the lungs: for a cough arises, and sometimes a slight pain. After this, as pus appears in a wound, so here does purulent matter: which, in a small quantity, forbodes no harm; for by this pus the ruptured vessels heal, as we see in external wounds. After a quiet sleep, the patient is observed to spit up well-concocted pus, which ceases to be excreted when the wound is closed up. It is, however, to be noted, that the cure of a wound in the lungs often takes longer time than in an external part of the body. For the air cannot be excluded; and the lungs, on account of their office in respiration, can never be otherwise than in motion. On this account, physicians wisely recommend rest in an hæmoptœ, forbid speaking, prescribe the mildest food, and caution against any passions of the mind, that the lungs may be as little fatigued as possible. Nor is this so much to prevent the return of the hæmoptœ, as that the ruptured vessel may more speedily be closed up. If the ruptured vessel be of a very small diameter, the cure is often complete, so as that the patient remains free the rest of his life, not only from a phthisis, but even from an hæmoptœ. But when larger branches of the vessels are ruptured, the wound will enlarge more, a greater quantity of pus will be formed, and there will be danger that the suppuration begun about the lips of the wound should be spread thro' the substance of the lungs, and cause a pulmonary consumption. For this reason Hippocrates remarks, that *those consumptions are most dangerous which arise from a bursting of the large vessels* <sup>9</sup>.

Another reason, why an ulcer of the lungs should follow an hæmoptœ, is deduced from the fabric of this viscus. If the lungs, after being inflated, are dried, and then cut asunder, they appear entirely cellular, not only because the extremities of the bronchia terminate in hollow membranes, but there plainly appears a cellular membrane, which fills up the interstices left between these small vesicles, in which the bronchia terminate, as is plainly seen by the help of a mi-

<sup>9</sup> *Tabes periculosissimæ sunt, quæ a ruptione crassarum venarum. Coac. Prenot. n° 438. Charter. Tom. VIII. p. 873.*

microscope after the vessels of the lungs have been filled by injections. If it happen, that, these vessels being broken, the blood is thrown upon this cellular membrane, this extravasated stagnating blood, growing putrid and acrid, may produce a suppuration, and an ulcer of the lungs: for the extravasated blood, which obstructs the air-vessels of the lungs, may easily be thrown off by a cough; but that blood which is collected in the cellular membrane of this viscus, cannot find an exit this way, but by first eroding the adjacent bronchia. The observations of Hippocrates<sup>r</sup> seem to confirm what we have said; for thus he speaks, when he is enumerating the causes from whence matter may be formed in the lungs: *When some one of the veins in the lungs is burst, which may happen from a strain; in this case, if the vein be somewhat large, it discharges a larger quantity of blood; but if it be smaller, less; and part of the blood is suddenly thrown up by the mouth; and part, unless the vein be contracted, is thrown upon the lungs, and there putrefies, and then forms pus; which in process of time is sometimes pure pus, and sometimes mixed with blood; and if the vein was very full, it throws out at once a great quantity of blood, and thick pus is afterwards excreted, being formed from the pituita flowing upon the lungs, and growing putrid.* For in this passage an hæmoptoë is first described; and then an ulcer, caused by blood falling on the lungs, and growing putrid there; which ulcer either discharges pure pus, or pus mixed with blood; nay, when the neighbouring vessels are corroded, a great quantity of blood is discharged.

From hence we understand, why Hippocrates<sup>n</sup> says, in his aphorisms, *A sanguinis sputo, puris sputum malum;*

<sup>r</sup> Quum venularum quædam in ipso rupta fuerit; rumpitur autem a laboribus: et cum rupta fuerit, si crassior fuerit venula, plus fundit sanguinis, si vero tenuior, minus; partimque quidem confestim sanguinem expuit, partim vero nisi contracta vena fuerit, in pulmonem funditur, in eoque putrescit; cumque putruerit, pus facit. Procedente vero tempore interdum pus sincerum, interdum suberuentum, et si uberius repleta fuerit venula, ipsa sanguinis copiam confestim a se evomit, pusque crassum ab ipsa accedente, ac intus putrescente, pituita expuitur. *De Morbis, Lib. i. cap. 5. Charter. Tom. VII. p. 537.*

<sup>s</sup> Sect. vii. Aphor. 15. Charter. Tom. IX. p. 299.



lum; "spitting pus after spitting blood, is a bad sign." For this is not to be understood of that spitting of pus in small quantity, which shews that the vessel which was burst begins to close, as was said a little before; but of such a spitting as discharges the pus in great quantities, and lasts a long time, and thus shews that an ulcer is formed in the lungs: whence Galen<sup>c</sup> well remarks in his commentary on this aphorism, *Non omne sanguinis sputum sequentem habet puris exspuitionem, sed tantum illud quod mali moris est*, "That spitting of pus does not follow on every spitting of blood, but only on that which is of a bad kind." But as an inflammation usually precedes an ulcer, which is caused by a rupture of some of the vessels of the lungs; and, as if this inflammation be considerable, it excites a fever; hence Galen<sup>u</sup> deduces an unfavourable prognostic, saying, *Quotquot autem phlegmone sic occupavit, ut jam febricitarent, horum nullus est omnino persanatus*: "But no patients as had such an inflammation, that they grew feverish, were ever cured." On the other hand, he gives hopes of a cure<sup>x</sup>, *si nulla phlegmones suspicio circa vas ruptum superesset*, "if there were no appearances of an inflammation about the ruptured vessel." From whence, as will be said hereafter in treating of the Cure, we are to guard by all means against this dangerous inflammation.

But worse consequences are to be feared from an hæmoptoë arising from an erosion, than from a simple rupture of the vessels; for if the closing of a vessel broken by some violent cause be difficult, how much more danger is to be feared, where the erosion has produced, not a wound, but an ulcer also! According to the remark lately cited from Aretæus, such an ulcer cannot be healed till it be reduced to the condition of a simple wound, as was said before, §. 402.: but for this end a greater and longer suppuration is required; therefore more danger attends an ulcer preying upon the lungs. But there remains still another and greater difficulty

<sup>u</sup> Ibid.    <sup>t</sup> Meth. Med. lib. v. cap. 14. Charter. Tom. X. p. 126.  
<sup>x</sup> Ibid. cap. 15.



ficulty. It was noted in the commentary on §. 387. where we treated of an inflammation terminating in suppuration, that it was necessary to the forming good pus, that the fluids passing through the vessels should be mild; whereas, in the present case, the acrimony of the fluids is supposed to be so considerable as to have corroded the vessels: and when an hæmoptoë has been occasioned by such a cause, this acrimony still subsists; which is not so easily removed as one might perhaps believe. Has it not been observed, that in scorbutic habits a very slight excoriation has degenerated into an ulcer, which has been very long before it could be healed, notwithstanding the physician has tried all remedies, and although the surgeon could easily come at it, and could keep it from the air? From all these things we see the reason why Galen<sup>2</sup> almost despaired of curing a phthisis which took its rise from such a cause: *Of such (says he) as have an ulcer in the lungs, those only seem to me to be incurable, in whom this ulcer is caused by a vicious corrosive humour, some of whom say, that their saliva has a brackish taste; for I think a long time is necessary to correct this acrimony of the juices.*

An hæmoptoë from an anastomosis, that is, a dilatation of the mouths of the vessels, is the most easily cured of any; because it implies no acrimony of the humours, and the vessels, although dilated, remain entire. Besides, from the very effusion of the blood a constriction of the vessels will ensue. For the distension of the vessels depends principally upon two causes, viz. the force of the heart impelling the fluids, and the resistance of the narrow extremities of the vessels: but as soon as these extremities being opened give a free passage to the blood, their resistance is considerably diminished; and hence, if, by the body being at rest, the circulation of the blood is rendered very quiet, the vessels contract themselves by their own elasti-

\* Ex iis vera qui ulcus in pulmone habent, ii soli insanabiles mihi videntur qui ex succi vitiosi erosione id possident, quorum aliqui, ut falsilaginem sputum sentire se aiunt, nam longo arbitror tempore omnino opus esse, ut succi corrigatur vitium. *Method. Med. lib. v. cap. 13. Charter. Tom. X. p. 126.*

elasticity, their diameter is lessened, and their mouths close in such a manner as no longer to give passage to the blood; and thus the hæmoptoë ceases. The only danger seems to be, lest the blood thus discharged by anastomosis should lodge in the cellular substance of the lungs, and by becoming putrid there produce an ulcer. But as it has been shewn, §. 830, no 2. that the passage is easy from the pulmonary artery into the bronchia, or air-vessels of the lungs; hence, such an effusion of the blood into the cellular substance of this viscus is the less to be feared, as the fluids propelled thro' the vessels tend most that way where they find the least resistance.

A phthisis being therefore a disease so difficult to cure, and at the same time so frequent, it will be necessary to consider accurately those signs which shew that a person is inclined to this disease; and also to enumerate the chief causes, which, when the body is predisposed thereto, may produce an hæmoptoë and phthisis: For these being well understood, cautions may be given for the avoiding them; or, if that cannot entirely be done, at least for correcting them.

This disposition consists, 1. In a tenderness of the arterial vessels, and in the impetus of the blood rendered some way or other acrid. This is known by the visible slenderness of the vessels, and of the whole body; by the length of the neck; by a flat and narrow chest, and depressed shoulders; by a very florid, thin, dissolved, acrid, and hot blood; by a very fair and rosy complexion, and a transparent skin; a cheerfulness of temper, and an early acuteness of genius and understanding.

The firmness of the vessels resists the fluids impelled into them; the greater therefore the strength of the vessels, the less danger will there be of their bursting: but the greater the impetus of the blood thro' the vessels is, the greater force will be put upon them.

If then an acrimony of the fluids be joined to an impetuous circulation and a debility of the vessels, there will be still greater danger of a rupture. But these things are observed to concur in those persons who are inclinable to this disease. Sydenham <sup>x</sup> has observed, that persons of a warm constitution, but not robust, are most liable to an hæmoptoë. Blood taken from the vein of such people, appears of a beautiful red colour; but the crassamentum is more loose, the serum salter, thinner, and less high-coloured, than in common healthy blood: and as the fine coats of the vessels easily shew the colour of the contained liquids; hence comes the fair colour of the skin, where the cutaneous vessels are so small as not to admit the red blood; and hence the rosy colour of the cheeks, from the transparent contents of the vessels that are sanguineous. Galen tells us <sup>y</sup>, *quod color a succis proveniat non a solidis animalis partibus*, “that the colour of animals proceeds from the fluids, not from the solids.” How frequently have physicians lamented to see this cruel disease snatch away, in the flower of their age, beautiful young persons of both sexes, as a storm beats down roses in their bloom!

If at the same time the structure of the breast be such, that the chest is flat, and consequently its cavity narrow, the lungs will be less easily dilated, and the fluids will with more difficulty pass through the vessels of the lungs, and hence will exert a greater force upon the sides of these vessels; whence such a formation of the thorax has always been disliked by physicians: and as the arches of the ribs are less convex, hence they recede more from the scapulæ, which are therefore more prominent, and somewhat resemble wings; whence also they are called by Aretæus <sup>z</sup>, *πίπυγες*. This deformity is greatly increased, when in a complete phthisis all the fat is gone, and the plumpness of the muscles destroyed, for then the shoulders appear still more distant from the ribs.

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<sup>x</sup> Sect. vi. cap. 7. p. 361.  
cap. 4. Charter. Tom. VI. p. 121.  
Morb. Diuturnor, lib. i. cap. 8. p. 27.

<sup>y</sup> De Sanitate Tuenda, lib. iv.  
<sup>z</sup> De Causis et Signis



However, this prominence of the shoulders is sufficiently discernible in those who are inclinable to this disease, even before their health is impaired: such persons are very properly called by Galen, *φθινωδεις*, that is to say, obnoxious to a phthisis, although not yet actually attacked by it. But he principally seems to consider a straitness of the breast (*σπασξ σενος & αβανης*) as denoting a tendency to this disease, and a prominence of the shoulders backward as a sign of this want of room in the breast. Such persons also have generally a long neck. Whether has this length of the neck any effect towards producing an acuteness of the intellect? Perhaps, in this case, the greater remoteness of the head from the heart, may so lessen the force of the blood ascending through the vertebral and carotid arteries, as to contribute to a more undisturbed and perfect exercise of all the functions of the brain; and daily observation shews, that youths of acute parts often die of this disease. And on the other hand, it was observed at §. 1010, N<sup>o</sup> I. that a short neck rendered persons liable to an apoplexy, because the vessels of the brain were more violently distended with the blood, on account of the nearness of the heart; and frequently such men are observed to be dull and slothful. Atticus, who was so famous for his wit and eloquence, describing the make of his own body, says, “ My body “ was then very slender and weak, and I had a long small “ neck; which conformation of body is esteemed very “ dangerous, if a man’s employment exposes him to fatigue, and to a great agitation and straining of the chest “ and sides in speaking <sup>a</sup>.” And he owns, that he spoke without any remission or variety of tone, with the utmost exertion of his voice, and a violent agitation of his whole body, so that his physicians and his friends advised him to desist from pleading. But he chose rather to travel to Asia, to learn to change his manner of speaking; for he was willing to expose himself to any danger, rather than forego the hopes of acquiring

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<sup>a</sup> Cicer. *Brutus, sive de claris oratoribus*, Tom. I. p. 114. cap. 51. p. 412.

same by his eloquence. He succeeded in his design<sup>b</sup>, for returning two years after, “ he was not only more  
 “ exercised in speaking, but almost entirely altered ;  
 “ the vehement tone of his voice was become mode-  
 “ rate, and his oratory more calm ; his sides had ac-  
 “ quired strength, and the habit of his body was less  
 “ inclining to extreme slenderness.” From this ex-  
 ample it appears, that persons inclinable to a phthisis  
 may avoid this disease, if they take proper precau-  
 tions.

Hence also it appears, how very pernicious the cu-  
 stom is, of wrapping the breast and abdomen in chil-  
 dren very tightly with swathes, &c. and of persons  
 farther advanced, with stays : for the ribs being by  
 these means depressed, the cavity of the thorax is strait-  
 ened ; and the abdomen being compressed at the same  
 time, the descent of the diaphragm is rendered more  
 difficult. Thus, by a pernicious art, such a disposi-  
 tion is induced on the naturally healthy body, as,  
 where it appears spontaneously, is judged by physi-  
 cians to be the forerunner of a fatal consumption.  
 Spigelius very justly inveighs against this custom,  
 and ascribes to it the frequency of consumptions in  
 England ; and then adds, “ That solicitude which  
 “ young women shew to make themselves appear ta-  
 “ per-shaped, is absurd, and incredibly pernicious ;  
 “ for whilst by stays, and other hurtful contrivances,  
 “ they straiten their chests, they do not consider that  
 “ they are preparing the way for consumptions and  
 “ decays .” On the other hand, he praises the cu-  
 stom of those countries, where (as he principally re-  
 marked at Venice) they endeavour to make the breast  
 rather large than strait ; and on that account, loosely  
 enwrap the infant with a slight roller, instead of bind-  
 ing his body tight. Nor do prudent physicians cease  
 at this day from opposing so absurd, so pernicious a  
 custom, but (which is to be lamented) without success ;  
 for it would be easier to snatch Hercules’s club from  
 his hands, than to prevail with foolish women to leave  
 off any received custom, however hurtful.

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<sup>b</sup> Ibid.<sup>c</sup> De Hum. Corp. Fabr. lib. i. cap. 2. p. 19.

Bennet considered also these appearances as prognostics of a phthisis: “ Sharp prominent shoulders, “ narrow præcordia, a strait and flat breast, a slender “ long neck, a flaccidity of all the parts about the “ breast, and a tenderness of the muscular flesh of the “ whole body d.”

2. In that weakness of the viscera, by which tenacious aliments are liable to form obstructions, to turn putrid and acrimonious, and by these ill qualities to ulcerate the lungs after an hæmoptoë. This weakness of the vessels is known by a slight fever, a dry cough, great heat, a redness of the lips, face, and cheeks, apparently increasing when fresh chyle gets into the blood, a propensity to sweat during sleep, a weakness, and a difficulty of breathing upon the least motion.

It is evident from physiology, that many of the viscera are employed in changing the crude aliment into the nature of our fluids, every one of which performs the respective function allotted to it. When therefore the viscera, by their weakness, are unequal to their offices, the fluids secreted from them must degenerate from their natural qualities, the chyle will be crude, viscid, and even acrid: for, unless the aliments can be subdued by the chylopoietic power of the viscera, they will follow their own nature, and degenerate into an acid, putrid, or rancid acrimony, or even into a tough glue, according to the different substances of which they are composed. Now the lungs are more liable to be affected by this fault in the humours, and sooner than the other viscera; because such a vitiated chyle, as soon as it mixes with the blood in the subclavian vein, must immediately pass through the lungs, which therefore will receive the first injury of this degeneracy of the humours. Hence Bennet observes, “ Those “ who indulge in luxurious eating, and in drinking to “ excess, are often taken with a phthisis, bringing on



“ a languor, and very dangerous <sup>c</sup>.” And this seems to be the cause why the consumption is so frequent among the English, who eat very strong food, and indulge themselves in drinking, and are less fond of vegetables than other nations. And inasmuch as the bile is of the greatest use in chylication, a greater depravation of the chyle is to be apprehended, if the liver, which is the organ that prepares the bile, be affected; on which account Bennet says in his singular style, (*Magis periclitantur pulmones a pressura per denegatam epatis percolationem, quam a regurgitatione ab infarctis lienis vasculis*), “ The lungs are more endangered by pressure from the straining through the liver being hindered, than by an overflowing from the vessels of the spleen being stuffed up <sup>f</sup>.”

The chyle, when not sufficiently assimilated by the action of the viscera, which perform the first concoction, may be faulty by too great viscosity, especially if the aliments abound with a viscid kind of glue; such are all unfermented farinaceous substances, strong broths or soups, especially those made from the feet of animals: these viscid juices stuff up the narrow extremities of the pulmonary vessels, and thus create obstructions. “ The bronchia are less stuffed up by extravasated blood, than by the nutritious juice, because this latter is concocted into a mucilaginous substance <sup>g</sup>.” But certainly these viscid juices may, by stagnation and the heat of the parts, acquire a great acrimony. Mild hartshorn jelly is pretty soon corrupted by the heat of summer; then indeed it loses its viscosity, but dissolves into a sharp putrid liquor. Dough soon acquires an acid acrimony. Hippocrates feared a dangerous erosion from soft phlegm accumulated in the lungs: he speaks thus, *The lungs are filled with phlegm, and pus is formed, which corrodes the lungs, nor do the sick easily escape* <sup>h</sup>. If this chyle is not viscid enough to stop in the lungs, but is already become acrid, or very near degenerating into an acrimonious fluid,

<sup>c</sup> Theatr. Tabid. p. 110.    <sup>f</sup> Ibid. p. 107.

<sup>g</sup> Ibid. p. 109.

<sup>h</sup> Pituita enim pulmones implentur, et fit pus; illud pulmones exedit, neque ægroti facile evadunt. *De Glandulis, cap. 5. Charter. Tom. IV. p. 274.*

fluid, and circulates in this state along with the blood through all the parts of the body, it may so change the whole mass of the blood, as to render it acrid, and deprave its natural quality; as was said in the chapter of the Cachexy. But in order for giving a supply of what is wanted, whether in the solids or fluids, a mild disposition of the juices is requisite; where this therefore is altered, nutrition will be imperfect, and the strength of the body will gradually decrease. Bennet, who very attentively observed every thing relative to this disease, says, “The smell of the body being much  
“changed from that which is customary, especially in  
“sweating, the colour of the skin (particularly the  
“complexion of the face) being faded, the habit of  
“the body being altered, and its vigour infeebled, are  
“to be accounted signs of this depravation of the hu-  
“mours being effected in chronical diseases, particu-  
“larly in a consumption i.” All these appearances are signs that such fluids are not re-supplied by nutrition, as are daily wasted from the body by the vital actions in a state of health; and whereas some parts of the solids are also perpetually wearing away, the solids will likewise decay, unless there be a supply of what is lost from them: and as the blood-vessels of the lungs are considerably thin towards their extremities, and have to sustain the whole force of the right ventricle of the heart urging the blood upon them; it is easy to conceive, why the lungs are most readily affected by such a cause. This seems to be the reason why Hippocrates prognosticates a consumption, when there appears signs of a great acrimony in the humours: *Eruptions appearing like excoriations by tearing or scratching, import a consumption of the habit of the body* k. For these eruptions are a sign that such particles are propelled to the extremities of the cutaneous vessels, as are capable of corroding the skin by their acrimony: but as the surface of the air-vessels of the lungs perspires much more than the external skin, there is a dan-  
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i Theatr. Tabid. p. 23.

k Eruptiones quasi abrasa cute (αμυχώδεις) habitus talem significant. Coac. Prænot. n° 444. Charteri. Tom. VIII. p. 844.

ger left these also should be affected in like manner. It is true indeed, that the neighbouring heart acts with such force upon the extremities of the exhaling vessels of the lungs, that it is not easy for any thing to stay there long enough to corrode them; but if a viscosity of the blood should be combined with this acrimony, or if the perspiration of the lungs should by any cause be diminished, such an effect might follow. Accordingly Bennet remarks, “ That persons subject to an hæmoptoë are chiefly affected with snow, hail, or “ rainy weather<sup>1</sup>,” and it is notorious, that these weathers are least favourable to a free perspiration. For the same reason, such erosions, or even pimples, are formed on the skin in consumptive persons, when acrid particles, which should be thrown off by perspiration, begin to stop in the pores. Bennet confirms the observation of Hippocrates by the following remarks: “ They who “ are subject to heats, or a scurf and itching on the “ skin, in autumn and winter, as is often the case, “ should frequently provoke sweats, as these are al- “ ways found of use to them<sup>m</sup>,” for he expected much good, if that acrimony which was generated in the humours could be expelled by the pores of the skin, as will be mentioned hereafter in treating of the cure. The signs which shew that there is such a disposition in the body, and that the lungs begin to be affected by it, are here enumerated: A slight fever comes on, either from an acrimony already generated in the humours, or because the viscera are too weak properly to assimilate the aliment; for that a fever may arise from this cause, was proved in §. 586. when we treated of the causes of fevers. And the lungs being irritated by the acrid chyle flowing through them together with the blood, a cough ensues, which is a dry one, because there is yet no matter to be expectorated. And as, at the time when fresh chyle is poured into the blood, the passage of the blood through the lungs is somewhat more difficult, even in healthy persons; hence arises a greater heat, and a fulness of the blood-vessels of the head, because the jugular veins are  
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<sup>1</sup> Ibid. p. 109.<sup>m</sup> Ibid. p. 113.



more difficultly emptied; this will be very evident to any one who compares the appearance of guests invited to an entertainment, on their first sitting down, with their looks after the feast is over when all their countenances are red and turgid; nor is this to be wondered at, as the distended stomach prevents the free descent of the diaphragm, and thereby diminishes the expansion of the lungs, and at the same time crude chyle in large quantities is circulating along with the blood. Persons who are obliged by their office to speak in public, sufficiently experience how much easier it is to perform this function before than after dinner.

But if all these inconveniencies are increased beyond what is customary at the time when fresh chyle is poured in plenty into the blood, that is to say, some time after meals, the diagnosis will be more certain; for that slight fever, which physicians (as was said §. 835.) call *hectical* or habitual, keeps one even tenor without intensification or remission; whence it happens, that the patient does not perceive he is ill: but in the progress of the disease, a manifest increase of this fever is perceived towards evening. But Galen well observes, that this exacerbation depends not on the nature of the hectic, which always keeps the same equal course; but is caused by the food taken in, which being once digested and distributed through the mass of blood, this fever returns to its former state. Besides, we remarked at §. 834. that, even in health, the pulse often grows quicker towards evening; whence we see another reason, why a hectic grows worse at this time of day. Why the sweat should so readily break forth in sleep, when men are inclinable to this disease, or are already attacked by it, was explained at §. 835. in treating of nocturnal sweats in an abscess of the lungs. But as the aliments we take in do not nourish, unless they are first converted by digestion to good chyle; and as the wasted fluids and solids are not replaced by the chyle till it is farther assimilated by the action of the viscera and of the vessels; and as the action of the lungs contributes greatly to produce this effect;

effect ; the reason why weakness accompanies this disorder is evident.

Violent panting on the least motion, is a consequence partly of weakness, and partly of the passage of the blood thro' the lungs being impeded ; whence we see the reason why consumptive persons do not feel this symptom so much in the beginning of the disorder, unless a vitious formation of the breast hinder the free expansion of the lungs ; but when, in the progress of the disorder, an ulcer is once formed in the lungs, then this ulcer pressing upon those vessels which are yet unobstructed, renders the passage of blood from the right to the left ventricle of the heart difficult. But when there is an ulcer indeed, but an open one, then matter is continually spit out, and the patient is less troubled with pantings : but the body is gradually wasted, and the strength fails, unless that ulcer can be healed ; which, as we shall see, it is very difficult to do.

3. That age in which the vessels, having acquired their full growth, resist any farther elongation, while in the mean time the quantity, acrimony, and motion of the blood, are increased : this age is from the sixteenth to the thirty-sixth year.

We know that the body grows faster, the nearer it is to its first origin. The embryo, from the minutest point, increases in the uterus, in nine months, to the so vastly greater size of the foetus : the infant still grows in bulk after the birth ; but in such a manner, that the quickness of the growth decreases as life advances, and entirely ceases in adults ; in whom the solid parts are now become so firm, that they can no more be stretched in length by the motion of the fluids, which are propelled thro' the converging vessels by the force of the heart. For all appearances seem to teach us, that the increase of stature depends on the elongation of the vessels, by the impetus of the fluids propelled through them ; so that during those  
stages

stages of life in which the vessels are most flexible, and the action of the heart more quick, and at the same time tolerably strong, the growth is very rapid. In young persons, the pulses of the heart are more frequent, and all the vessels are tender and yielding. This is farther confirmed, by observing, that when the momentum of the blood upon the vessels is increased, as it is in acute disorders; when persons are young, a great and sudden increase of stature is perceived after recovery from these disorders, so as that they often grow more in one fortnight in these circumstances than they had done for a whole year before. Daily observation shews this; nay, I have sometimes seen young persons who had almost done growing, on being seized with the small-pox, to have become much taller presently after recovering from this disease.

When a man therefore arrives at that age which will not suffer the vessels to be farther stretched in length by the force of the impelled fluids, their sides are more distended, and the blood urges with greater force on the extremities of the vessels. Hence it is, that bleedings at the nose so frequently happen to young persons, either by a dilatation of the mouths of the vessels, or by a rupture of them, if the impetus of the blood be suddenly augmented, or if there be a plethora. Besides, about this age there seems to be also a greater acrimony of the humours: for all the juices are mild in new-born infants and children, who are best pleased with the mildest food; their urine has scarce any smell or taste, and is of a wheyish colour. About the time of puberty, the urine grows yellower and more acrid; a fetid sweat is observed about the arm-pits and the groin; and the passions of the mind are so altered, that the whining child is now become a hardy and adventurous youth; he finds in himself an unusual vigour, together with great agility of his limbs, and hence is fond of every occasion of trying his strength: if, just at this season, young persons indulge in high-feeding, wine, and lust, and use violent exercise, it is very evident how great a dan-



danger there is, lest the fluids, increased in quantity, become more acrid, and, circulating with greater impetuosity, should burst the vessels, those of the lungs especially, where the blood is impelled by the whole force of the right ventricle of the heart, from the large trunk of the pulmonary artery, into very small and tender arteries. It is true indeed, that, about this time of life, a salutary hæmorrhage from the nostrils frequently happens, and diminishes this danger. Hippocrates <sup>n</sup>, enumerating the diseases which are most common to the different ages of life, tells us, that an hæmorrhage of the nose often happens to persons advancing to puberty. Galen <sup>o</sup>, in his commentary on this passage, ascribes this to a redundancy of the blood; saying, “ That it is now generated in greater quantities, but that less of it is consumed than before, because that the growth also, in proportion to the size of the body, is slower at this age than in the preceding ones.” In the mean while, lest we should too much confide in the salutary hæmorrhage from the nose, he adds <sup>p</sup>, that an hæmoptoë and consumption often come upon young persons.

Sydenham <sup>q</sup> also has remarked, that a bleeding at the nose often attacked those whose blood was over-hot, and who were of a weak constitution. “ That hæmoptoë, which on the borders of spring and summer attacks men of warm but weak constitutions, and those whose lungs are somewhat infirm, and which more frequently happen to the young than to the old, is nearly of the same kind with the hæmorrhage already treated of by me;” and he advises nearly the same method of cure.

Bennet <sup>r</sup>, who was so accurate an observer of every thing that relates to this disease, acknowledges also the usefulness of an hæmorrhage from the nose, for preventing a phthisis, or at least for prolonging life. His words are, “ All consumptive persons who have frequent moderate bleedings at the nose, hold out the

<sup>n</sup> Aphor. 27. Charter. Tom. IX. p. 122.      <sup>o</sup> Aphor. 27. sect. iii. Charter. Tom. IX. p. 122.      <sup>p</sup> Aphor. 29. Ibid. p. 125.      <sup>q</sup> Sect. 5. cap. 7. p. 360, 361.      <sup>r</sup> Theatr. Tabid. p. 11.

“ the longer for this discharge ; and if this hæmorrhage accompany a discharge of blood from the pulmonary artery, the danger is less than when the discharge is from the pulmonary artery alone.” And this same author, in another place <sup>q</sup>, which was quoted at §. 741. has observed, that a moderate periodical bleeding at the nose keeps off a consumption, and is much more serviceable than repeated phlebotomy : and he confirms the usefulness of such an hæmorrhage, by the example of a youth who had received a consumptive habit from his parents, and who nevertheless enjoyed almost uninterrupted health from sixteen to twenty-five years old, by means of a bleeding at the nose. For towards the end of the spring, and almost through the whole summer, once or twice a-day he bled from the nose an ounce, or sometimes two ounces of blood. At twenty-five this hæmorrhage stopt on his taking cold in his head : soon after, his breast began to be overcharged, and an hæmoptoë and other symptoms of a beginning phthisis followed. The lancet was used, but with little success ; but a copious hæmorrhage returning, the breast grew freer ; and he escaped so great a danger, without any considerable alteration in his health.

If therefore a person was freed by this means from an hereditary consumption, which all physicians acknowledge to be the most difficult of cure, what may not be hoped in other cases from the same salutary discharge ? and this should also be a caution to physicians, lest, overcome by the importunity of the patient or his friends, they should imprudently stop this hæmorrhage by any remedies.

But although every stage of life be liable to an hæmoptoë, yet it is certain this symptom occurs most frequently in the time of life between adolescence and manhood. Galen <sup>r</sup> computes *adolescence* to last from eighteen to twenty-five, and from that time to thirty-five he calls persons *young men* ; and he

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<sup>q</sup> Ibid. p. 14, 15.  
Tom. IX. p. 200.

<sup>r</sup> Comment. in sect. v. Aphor. Charter.

thought Hippocrates <sup>s</sup> used the plural word *ætatibus*, ages, because in that interval between eighteen and thirty-five those two stages of life youth were comprehended. Aretæus <sup>t</sup> says simply, *Juvenes autem usque ad consistentem ætatem (μεχρι αχμης) post sanguinis sputum pthifici fiunt*; “Youths till the time of full growth, “after an hæmoptoë become phthifical.” But Hippocrates, as has been said before, limited the space of time in which there is the greatest danger of an hæmoptoë to a certain number of years. However, there is a danger of this even before the age of eighteen; as we see both this and the hæmorrhage from the nose to happen at the beginning of puberty, which in most people is before the age of eighteen. This Hippocrates <sup>u</sup> notes in another place, saying, *Cum venere uti incipiunt, aut hircire, sanguinis profluvio laborant*; “When they begin to use venery, and the beard “begins to appear, they are seized with an hæmorrhage in the nose.” In those, therefore, in whom, on account of an hereditary taint, or a vitious formation of the breast, or of any of the signs enumerated in the first number of this paragraph, a phthisis is to be feared, we ought not to wait for the age of eighteen; but every precaution is to be taken, before this, to prevent an hæmoptoë, and the phthisis consequent thereupon. After thirty-five, there is less reason to apprehend this disorder, as all the vessels are by that time become strong, and at the same time the impetuosity of youth has subsided; and hence all the passions are become more calm. In the state of manhood, greater prudence, and the various cares of business, hinder most people from indulging in excessive pleasure: the frame of body at this age is in the medium, between the flexible softness of the new-born body, and the dryness and callosity of old age; that is to say, the vessels have attained their due firmness.

#### 4. In an hereditary disposition. Consult here what was

<sup>s</sup> Aphor. 9. sect. v. ibid. 199. & Coac. Prænot. n<sup>o</sup> 439. Charter. Tom. VIII. p. 878.

<sup>t</sup> De Causis et Sign. Morb. Diurn. lib. i.

cap. 8. p. 36.

<sup>u</sup> Lib. vi. Epidem. Textu 25. Charter. Tom. IX.

p. 457.



was said at §. 24, 26, 29, 38, 39, 40, 41, 44, 48, 60, 61, 64, 69, 72, 82, 84, 86, 100, 106; for these being compared with what has been now said, explain, define, and presage the nature, cause, and effects of an hæmoptoë.

That diseases are propagated from parents to their children is confirmed by numberless instances, concerning which we have treated in another place, (§. 1075.) This is equally confirmed with regard to the phthisis in particular; and the ancients seem to have thought those persons in great danger of this disorder, whose parents were destroyed by it. For we read in Plutarch as follows: "For we are not able to attain to truth and certainty, even in those things which are the object of our own actions; for instance, why we order the children of those who die of a phthisis, or a dropsy, to sit with their feet in water while their parent's body is burning? for it is thought that by this means the disease is hindered from passing to them." Bennet<sup>w</sup> does not hesitate to call the impression of this disease received from the parents *indelible*; not indeed that the phthisis is absolutely unavoidable by those whose parents have died of this disorder; but because there always exists in them a pre-disposing cause, which may bring forth the disease when any circumstances shall give an occasion to it; and the disease so produced will be very hard to cure. Hence, in these cases, the greatest precaution and watchfulness are necessary, as will be shewn hereafter, §. 1207. lest an hæmoptoë should come on about the age of puberty; which a phthisis will certainly follow, where there is an hereditary taint.

It has been already observed, §. 24. that sometimes the solid fibres of the body cohere so weakly, as to be broken by that motion which is the mere effect of health, or however by the least excess of this motion: hence, §. 26. it appeared, that a rupture of the vessels was much to be feared: which is also confirmed by

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<sup>v</sup> Comment. de his qui fero a numine puniuntur. Tom. II. p. 558.

<sup>w</sup> Theatr. Tabid. p. III.

the remarks on §. 29. But it was proved at §. 38, 39, 40, 41, that the same fault might exist in the vessels and viscera: and at §. 44. the effects of this fault are enumerated, among which is reckoned an easy solution of the vessels, by internal or external causes, acting by acrimony or motion; and among the consequences, a phthisis was also reckoned, which was farther confirmed by the remarks on §. 45, and 48.

If at the same time it be considered, that an acrimony may be produced in our fluids, and that of various kinds, we may conceive another cause of an hæmoptoë: at §. 60, 61, 64. we treated of an acid acrimony; and at §. 82, 84, 86. of the putrid alkaline acrimony, and its most pernicious effects.

But the fluids by degenerating into an inert viscidit<sup>y</sup>, of which we treated §. 69, 72. may likewise impair health: for although a caco-chymia of this kind should be unaccompanied with any acrimony, yet by obstructing and distending the vessels of the lungs, it may give rise to this disease; especially if there be a weakness of the solids at the same time, as often happens; of which mention was made above, at n<sup>o</sup> 2.

But even altho' all the humours should be healthy, and neither acrid nor viscid, it was demonstrated at §. 100. that, by their motion only being increased, stoppages and destructions of the vessels might be caused, together with a very noxious degeneracy of the humours; so that an hæmoptoë and a phthisis might be produced by this cause, if the vessels of the lungs were hurt by it. This has been observed in acute inflammatory disorders, and in the small-pox.

Finally, although there should be no fault either in the solids or fluids, and the motion of the fluid thro' the vessels should not be excessive; yet from the too great quantity even of healthful blood, which excess the physicians call a *plethora*, the vessels may be so over distended, as to break, and thus an hæmoptoë may be occasioned. This was observed in the comment on §. 106.

All therefore that is said in the aphorisms quoted here in the text, deserves to be compared with the  
con-

contents of the present paragraph. For by this means we shall better comprehend the causes of this disease, and with greater clearness determine what is to be hoped or feared from it. For instance, if, in a plethoric subject, an hæmoptoë comes on, either from an anastamosis, or a rupture of the vessels, we may hope to cure it, as it is easy to remove the plethora by bleeding. On the contrary, if it arises from a weakness of the vessels, and the humours be acrid, there is then great fear of a consumption, or that the disease will prove fatal, if an hæmoptoë ensues; because these causes can neither so soon nor so easily be remedied as the former, and an erosion of the vessels very frequently ends in an ulcer.

But the hæmoptoë, the consequence of this state of the fluids and solids, is hastened, 1. By a suppression of any of the usual evacuations, chiefly of blood; such as the piles, menses, lochia, a bleeding at the nose, a neglect of customary bleeding, especially in plethoric habits, and those who have lost a limb.

There are three principal ways, by which, in time of health, those things are expelled from the body, which, were they allowed to remain, would be very pernicious to it; namely, by stool, urine, and perspiration. If these excretions are not duly performed, diseases, and those sometimes very dangerous, often follow; but the lungs do not seem in these cases to be more exposed to injury than other parts of the body. But there are other excretions, by which noxious superfluities are discharged from the body, which would be attended with the worst consequences if they were suppressed; and from the retention of these acrid particles the vessels of the lungs are corroded, and an incurable phthisis is brought on.—An acrid serum frequently oozes from the heads of infants, which drying into a crust, becomes fetid; and sometimes a like kind of disorder spreads all over the skin. If this excretion be checked either by accident or design, the



most terrible disorders and convulsions are the consequence. Nay, the lungs are frequently thence affected, and a phthisis brought on. I have sometimes seen a periodical asthma arise from thence, which lasted many years from the same cause, the fits of which went off each time by a like cutaneous eruption on the face; about the time of puberty, the intervals of the fits grew considerably longer, and the person lived afterwards free from this complaint: whence we learn, that the morbid matter is not in these cases discharged by the usual channels, but seeks an issue by peculiar passages, which cannot be predetermined by the rules of art, but can only be known by a careful observation of what happens to patients.

On this account experienced practitioners are not studious to stop such excretions, although they are often troublesome, or to drive them into other channels, but very cautiously and slowly. Thus Dr Mead very wisely gives the following advice: “ Vicious humours  
“ have each their peculiar quality; and as their eruptions are generally by way of crisis, though they  
“ may be lessened, they can scarce be discharged with  
“ safety by other passages than those which nature directs \*.”

There are many instances, in medical history, which shew, that a phthisis arising from an acrimony of the blood has been cured by such excretions. Bennet relates †, that he had seen many who had a muriatic acrimony in the blood, yet remained free from the erosion of the lungs, because the acrimony fell upon other parts: of which he gives a remarkable instance in  
“ a merchant of London, who was wasted almost to a  
“ skeleton, in whom this acrid saline humour, which  
“ had at first fallen on the lungs, at last made itself a  
“ passage to other parts, caused the most loathsome ulcers in the palms of the hands, and corrosive ulcers  
“ in the feet and heels, the lungs still remaining uninjured.” But elsewhere he says, this is a certain diagnostic; “ if from some cause, by a revulsion, the  
“ salt humour be diffused upon the limbs, or the sur-  
“ face

\* *Monita et Præcept. Medic.* p. 32.

† *Theatr. Tabid.* p. 64.

“ face of the body, and from thence the breast gains  
 “ strength <sup>z</sup>.” and in another place he remarks,  
 “ That in an infant whose lungs were touched, and  
 “ who laboured under an asthma, a tumour of the  
 “ size of a walnut arose on the middle of the leg, and  
 “ this restored him to health for three months; but  
 “ the disorder returning, he was taken with an asthma  
 “ and diarrhœa, and died <sup>a</sup>.”

Many years ago, a learned and experienced physician wrote to me, that while a patient under his care, who had a cough with a fever and a decay, lived on a milk diet, in the eleventh month of this regimen, a fleshy excrescence arose in the first and second joint of the thumb of the right-hand, from whence oozed a sharp humour, which, when dry, resembled chalk; and while that humour continued flowing, his strength returned: the patient then left off the milk diet: this fungous flesh continued to discharge this humour for the space of two months, and the patient was perfectly recovered. I wondered afterwards to find in Solanus de Luque <sup>b</sup>, observations which confirm this. As I had admired his remarks on the pulse, as a critical sign foretelling a hæmorrhage of the nose, a diarrhœa, &c. I had a vehement desire to see his other published tracts, and at last got what I desired from Spain; and found in him, that, in a very dangerous consumption, he made an issue between the fore-finger and the thumb, and with great success.

I should suppose, that he herein imitated that which he had observed to be serviceable when it was effected by the force of nature, and therefore chose this place for making the revulsion. However, such drains made by art in other places, by which the sharp morbid matter may find a passage, are of service. We read in Cœlius Aurelianus <sup>c</sup>, that Themison used to order external ulcers to be made, and to be long kept open, that a revulsion of the humour might be made to the external parts, and thus the internal ulcers be healed. Cœlius Aurelianus indeed disapproves this method;  
 but

<sup>z</sup> Ibid. p. 101.    <sup>a</sup> P. 13.    <sup>b</sup> Origen. Morbosæ commun. &c.  
 p. 168, 178.    <sup>c</sup> Morbor. Chronic. lib. ii. cap. 14. p. 428.

but at least it appears from hence, that the ancients recommended such a method in a consumption. Hil-danus<sup>d</sup> says, he can prove, by many instances, the usefulness of a seton in the nape of the neck for the cure of this disease, and shews its wonderful effects by the following case: “ A lady of quality was troubled for  
 “ many years with a defluxion on her breast, and had  
 “ used various remedies to little purpose; at last she  
 “ spit up not only blood, but great quantities of puru-  
 “ lent matter, and fell into an hectic, with a wasting  
 “ of the body, and loss of strength: He used proper  
 “ remedies; but applying a seton to the neck, the pa-  
 “ tient soon recovered, and afterwards bore several  
 “ children, whereas she had not been pregnant for  
 “ many years before.”

These instances sufficiently prove, that an hæmoptœ and phthisis may be produced by a retention of any customary discharges; and at the same time it appears, that nature often finds a way by which she expels these acrid fluids from the body, and that art frequently imitates these efforts of nature successfully.

But although, as will presently be mentioned, an hæmoptœ be often occasioned from the suppression of sanguineous discharges; yet it is also frequently observed in those whose blood is acrid and thin (as was said above), in whom there seems rather to prevail an acrimony of the humours, than an abundance of good blood: and hence an hæmoptœ, caused by an erosion of the vessels, is to be apprehended, which is always the most dangerous. Hoffman<sup>e</sup> justly remarks, that they are mistaken who suppose an abundance of wholesome blood of a good consistence to be the proximate and material cause of hæmorrhages; for in such constitutions, the vessels are strong, and the humours mild: he rather feared hæmorrhages in those whose blood abounded with a larger proportion of serum than crassamentum, which is always the case in subjects of a softer texture, and is a proof also that the blood is thin and acrid.

It

<sup>d</sup> Observ. Chirurg. cent. 3. obs. 38. p. 220.  
 et System. Tom. IV. parte ii. p. 5.

<sup>e</sup> Medic. Ration.



It is however certain, that discharges of blood suppressed give rise to this disease; and that the best remedy is either to restore these evacuations, or to promote other discharges in places less dangerous.

The piles.] Frequent instances of this are to be found in good writers, which would be too long to enumerate. I have seen this disorder arising from such a cause in a man of fifty, in other respects healthy, who had a copious hæmorrhoidal discharge twice or thrice a year. This discharge being imprudently checked, he began to perceive a wonderful fluttering in his pulse, and soon after a tension in the left flank, which ascended towards the breast, and an hæmoptoë presently followed. Although various means were tried, the former periodical discharge could never be restored; but the hæmoptoë returned frequently with the same symptoms, and at last he died consumptive, his whole body swelling before his death. Hippocrates of old forewarned, *That in the cure of bleeding piles, of long standing, unless one be left running, there is a danger of a dropsy or a phthisis*<sup>f</sup>; both appear to have taken place in this unfortunate man.

On the other hand, blood being drawn from the hæmorrhoids by leeches was of great service to Duretus<sup>g</sup>, who, when past fifty, on a hæmorrhage from the nose, to which he was subject, being suppressed, was troubled with a frequent and copious spitting of blood, but recovered so by this means, as to have no remains of the disorder; for he says of himself, “that he passed the next year in practising physic, in writing, and in reading Hippocrates with a clear voice and firm chest.”

Menses, lochia.] It will appear hereafter, that the menstrual blood, when it is obstructed, will sometimes discharge itself by wonderful passages in various parts of the body. It is indeed true, that this often happens from a dilatation of the vessels, without any rupture; and that, when the evacuation ceases, the part

from

<sup>f</sup> Diuturnas hæmorrhoidas curanti, nisi una fervetur, periculum est hydropem succedere vel phthisin. *Secl. vi. Aphor. 12. Charter. Tom. IX.*

<sup>g</sup> Lud. Duret. in *Coac. Hippocrat.* p. 189.

from which the discharge was made suffers no kind of alteration: whence not much danger is to be apprehended, if the discharge is made through a part not necessary to life. On which account Hippocrates says, *An hæmorrhage from the nose coming on in a suppression of the menses is good<sup>h</sup>*. But when the course of the menstrual blood is diverted on the lungs, there is more danger to be feared; although physicians have observed, that an hæmoptœ from this cause has sometimes subsisted a great while without a phthisis following it. Thus we read in Hoffman<sup>i</sup>, of a lady of quality, who had a great fright at the time of her menses, which were immediately suppressed; on which there followed an oppression of the breast, anxiety of the precordia, and a violent palpitation of the heart: the next month the menses appeared in a very small quantity; but an hæmoptœ, preceded by the above symptoms, came on, which ceased after four days: this hæmoptœ returned every month, for nine years successively; but so as to intermit in the time of pregnancy, returning after delivery, and preserving its usual periods while she suckled her children; her health all the time being not in the least affected by it. Bennet<sup>k</sup> confirms this also by his observations, shewing that nature becomes used to this revulsion, and bears it with less injury. The event is not however always so fortunate, as the menstrual blood frequently obstructs the vessels of the lungs, raises an inflammation, and produces an ulcer of the lungs. Thus Hippocrates observes, *That in some women, when the menstrual blood has been in large quantities in the womb for two months, and the discharges thereof have been suppressed, the blood is thrown upon the lungs, and all the symptoms of a phthisis are produced; nor can such patients recover<sup>l</sup>*. But the great-

<sup>h</sup> Mulieri menstruâ deficientibus sanguis ex naribus fluens bonum. *Scit. v. Aphor. 33. Charter. Tom. IX. p. 214.*

<sup>i</sup> Medic. Ration. et System. Tom. IV. parte ii. p. 46. Vide et Aretæum de Causis et Signis. Morbor. Acutor. lib. ii. cap. 2. p. 13.

<sup>k</sup> Tabid. Theatr. p. 13.

<sup>l</sup> Quibusdam mulieribus quum bimestres menses copiosi in utero extiterint, ubi intercepti fuerint ad pulmonem feruntur: his omnia contingunt quæ in tabe dicta sunt, neque superesse possunt. *De Morbor. Mulier. lib. i. cap. 4. Charter. Tom. VII. p. 731.*

greatest danger seems to be at that age in which the menses naturally make their first appearance, as Bennet remarks: "If a phthisis comes on in virgins at ripe years, who have not yet had the menses, and a reflux of the blood on the breast happens, this produces a very great depravation of the humours, sudden emaciation, and death in the event<sup>m</sup>."

But there is still more danger from a suppression of the lochia, as the blood stagnating in the vessels and sinuses of the uterus, and by the admission of air readily putrefying, may produce the most pernicious effects in every part of the body to which their course is directed: See §. 1329. Hippocrates<sup>n</sup> tells us, that coughs, asthmas, obstructions, and suppurations of lungs, may arise from a suppression of the lochia.

Customary bleeding, &c.] It has been shewn already, of how great service an hæmorrhage from the nose is to those persons who are in danger of an hæmoptoë. That customary bleeding should not be left off all at once, was observed §. 106. where all these things are discussed, as also the plethora. For too great a fulness of the vessels is always to be guarded against, when an hæmoptoë is apprehended.

The danger of a plethora, and of an hæmoptoë consequent upon it, in persons who have lost a limb, was shewn at §. 474.

2. By any great violence done to the lungs by coughing, hallowing, singing, running, or any great straining of the body, by anger, and by any kind of wound.

That even the larger vessels may be broken by a great force, is too well known; how much more may this be feared of the tender vessels of the lungs? It seems rather strange that this should not oftener happen, and especially from a cough, which violently agitates the whole chest, and at the same time forces large quantities of blood into the vessels of the lungs.

Hence

<sup>m</sup> Tabid. Theatr. p. 111.  
Charter. Tom. VII. p. 755.

<sup>n</sup> De Morb. Mulier. lib. i. cap. 45.



Hence we see, that, in a violent cough, the whole face swells, and the eyes are suffused with blood; as the blood cannot return from the head by the veins, the right ventricle of the heart having no room for it, and its passage through the lungs is obstructed, while it moves faster than usual in the arteries: and in the tussis ferina, or whooping cough, which is sometimes epidemic, we see many of those afflicted with it grow black in the face, and are almost suffocated; whence often a spitting of blood follows. I was told by a physician worthy of credit, that the intestines of a boy were burst in a fit of this cough; and Hoffman<sup>o</sup> relates the case of one who had one of the vertebræ of the back broke by the violence of a cough.

How great violence the lungs may suffer from shouting, singing, laborious efforts, &c. was said at §. 824. when we treated of the causes of a peripneumony; it is not strange, therefore, that a rupture of the vessels, and a dangerous hæmoptoë, should be caused by such means. Antigonus<sup>p</sup> burst his lungs by shouting in a battle; or, as others relate, by crying out for joy after the victory, *O faustum diem!* “O happy day!” He threw up a large quantity of blood, and being seized by a violent fever died: His lungs were touched before; but he would not give way to his disorder, hoping to expire gloriously in victory, and amid the slaughter of barbarians. There is the greatest danger of all, that an hæmoptoë should be produced, if a man, heated with rage, exerts his voice with great vehemence. Thus we read of Sylla<sup>q</sup>, “That inflamed with violent emotions of passion, and exerting his voice too forcibly, he hurt his breast, and expired in a rage, with an effusion of blood.” Yet he was sixty years old, at which age the vessels are firm, and even begin to grow callous; on which account old persons are least subject to this disorder, and in them it seldom happens but from some violent accident.

Hence

<sup>o</sup> Medic. Ration. et System. Tom. IV. part. 3. p. 377. <sup>p</sup> Plutarch. Agis et Cleomenes, Tom. I. p. 819. <sup>q</sup> Valer. Maxim. lib. ix. cap. 3.

Hence Hippocrates <sup>P</sup> very wisely cautions, that when a person is recovered from an hæmoptoë produced by such a cause, *ad ventem celeriter ne currat, neque equum, neque currum conscendat, vitet etiam tum clamorem tum excarescentiam, periculum enim est redire morbum*; “ he should not run swiftly against the “ wind, nor ride on horseback, nor in a chariot, “ and should avoid shouting and passion; for there is “ danger of a relapse:” and elsewhere <sup>Q</sup>, where he describes the diseases of the women of a city situated toward the north, after mentioning that they have few miscarriages, but difficult labours, he adds, *Tabes etiam frequentes a partu contingunt, præ violentia enim ruptiones et vulsuras habent*; “ Consumptions also frequently come on after their labours, because the “ difficulty of them occasions strains, and thence ruptures of the vessels.” Certainly, in the last efforts of a woman in labour, when she is just at the point of delivery, a great strain is put on the vessels, especially if the woman is somewhat advanced in life, and at the first birth; and I have known the vessels of the brain burst, and an apoplexy follow on these occasions. In bodies of a tender frame, the vessels of the lungs are so strained by this effort, that an hæmoptoë is the consequence.

At the same time it is evident, that these causes will still be more likely to produce this effect, if a great part of the vessels of the lungs are obstructed by a schirrhus or polypus, or so much compressed by some other tumour, that they cannot transmit the blood freely; for then those vessels of the lungs which are still pervious, have so much the greater force to sustain, if the motion of the blood be suddenly accelerated by any cause. Thus Hoffman <sup>R</sup> observed in a young virgin, who had a difficulty of breathing, occasioned by a suppression of the menses, an enormous quantity of blood was thrown up in coughing; and at the same time several great, hard, fleshy lumps were extracted

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<sup>P</sup> De Intern. Affect. cap. 1. Charter. Tom. VII. p. 639.  
<sup>A</sup>ere, Locis, et Aquis, n<sup>o</sup> 22. Charter. Tom. VI. p. 192.  
<sup>R</sup> Ration. et System. Tom. III. cap. 16. p. 365.

<sup>Q</sup> De  
<sup>R</sup> Med.

from the fauces, which, on being examined, were found to be polypous concretions, and weighed more than four ounces. The preceding symptoms, and the hæmoptoë which proved mortal, seem to shew that the vessels of the lungs had been obstructed with polypous concretions, which, on the bursting of the lungs, were thrown out together with the vast effusion of blood. For the same reason it is, that an hæmoptoë sometimes follows, on a person's drinking a great quantity of cold liquors when he is very much heated. On another occasion, when we treated of the causes of a pleurisy, §. 881, we observed, that the ascending trunk of the vena cava, and the large right ventricle of the heart, reclined on the slender tendinous part of the diaphragm: hence, when the stomach is suddenly filled with cold liquor, there is reason to fear, lest the blood which is about to pass through the vessels of the lungs, coagulating by this sudden chill, should entirely stagnate in their narrow extremities, and bring on a sudden and fatal peripneumony, or by bursting the vessels cause a very dangerous hæmoptoë. “ Cleomenes “ marching hastily with his forces, and drinking water when he was heated, threw up a large quantity “ of blood, and was rendered speechless:” and I have sometimes seen a like misfortune from the same cause. Trallian<sup>t</sup> mentions a sudden and violent cold among the causes of an hæmoptoë; as does also Galen<sup>u</sup>, who says, that the cold does not of itself cause a rupture of the vessels, but that the coats of the veins being rendered hard by cold, resist more against being stretched longitudinally, and thus are more easily broken; and he sets down as the immediate cause of a rupture of the vessels, either a violent motion, or a plethora. But as the tender vessels of the lungs, through which the blood moves in this viscus, have a great extent of surface exposed to the air, if the cold be very great, the vessels will be contracted, the fluids will be condensed, and by this means the blood propelled from the

<sup>s</sup> Plutarch. Agis et Cleomenes, Tom. I. p. 811.  
cap. 1. p. 286.

<sup>t</sup> Lib. vii.

<sup>u</sup> De Locis Affectis, lib. iv. cap. 2. Charter.  
Tom. VII. p. 475.



the right ventricle of the heart will exert more violence on the vessels when their cavity is straitened, and the blood almost congealed with cold is less fit to pass them. Hence Hippocrates says, *Violent cold, such as that of snow and ice, bursts the vessels, and occasions a cough*<sup>v</sup>. And the same observations occur in his aphorisms<sup>w</sup>, as was remarked §. 793.

That an hæmoptoe should follow a wound is easy to be conceived; and on this subject the reader may consult what we have said before on Wounds of the Thorax.

3. By an acrid, salt, and spicy diet, and by drink of the like kind; by a particular manner of living; or by any disease which increases the quantity, acrimony, velocity, rarefaction, and heat of the blood; hence it is, that an hæmoptoe so often happens in acute fevers, in the plague, small-pox, and in the scurvy.

It has already been said, under this aphorism, that to persons inclined to this disease, an acrimony of the fluids is very dangerous, lest the vessels should be corroded thereby, and the worst species of an hæmoptoe be produced. It is easy to conceive therefore, that if they eat or drink such things as are apt to produce an increased acrimony of the humours, and especially if the food likewise heats the body and rarefies the fluids, the present malady is to be feared as the consequence, particularly in bodies predisposed to it; whence it is, that an hæmoptoe so often follows hard drinking. But all these dangers may be avoided by temperance.

But no man can flatter himself to live exempt from all diseases by the force of which the vessels are broken. Sometimes the humours are so vitiated as to corrode the vessels; sometimes a great impetuosity of the blood, increased in its motion by a fever, concurs with

<sup>v</sup> Frigidum valde, venas frangit et tussim citat ut nix et glacies. *Epidem. 6. sect. 14. Charter. Tom. VII. p. 445.*

<sup>w</sup> Sect. 5. Aphor. 24. *ibid. p. 209.*

with an acrimony. But this last was discussed before in the history of fevers, particularly at §. 741. in treating of the dangerous symptoms attending an ardent fever; where it was mentioned, that a spitting of blood sometimes proved mortal in this kind of a fever. Diembroek <sup>a</sup> saw a stout soldier who had the plague, seized on the sixth day of the disease with a violent hæmoptoë, and gave him over; as all whom he or other physicians had attended in the plague, to whom this happened, died soon after. He however recovered; although, after the plague was cured, the hæmoptoë frequently returned, and spitting of pus followed it. The author very justly esteemed this a rare case. We shall see hereafter at §. 1396. that a very dangerous hæmoptoë sometimes happens in the small-pox. We observed, §. 1151, n<sup>o</sup> 3. that, in the worst stage of a scurvy, hæmorrhages frequently happen from various parts of the body, and among the rest from the lungs. It has also been remarked, that some poisons produce such acrimony in the humours, that, the lungs being corroded, men die of a slow decay. We read in Plutarch <sup>b</sup>, that Philip contrived that a poison should be given to Aratus, the effects of which were not instantaneous, nor its acrimony very violent, but of such a quality, as to excite first a slow fever and a faint cough, and to bring on a gradual decay. He bore the disorder without much complaining, as tho' he had been attacked by some common disease, although he knew very well that poison had been given him; but when one day, in his chamber, one of his acquaintance being present, he spit blood, he said, "O Cephalon! these are rewards bestowed by royal friendship."

§. 1199. **H**ENCE an hæmoptoë begins with a slight pain, a moderate heat, and an oppression and anguish in the chest: the blood thrown up, is generally florid, of a scarlet colour, and frothy: there is also a cough, and a whee-

<sup>a</sup> De Peste, hist. 83. p. 301, 302.

<sup>b</sup> Aratus, Tom. I. p. 1051.





toms in the course of my practice, though all seldom meet in one person; and I have seen persons who had been subject to an hæmoptoe several times, who knew it was coming on when they perceived a kind of tickling in the aspera arteria, a slight oppression of the breast, and that fluctuating motion one while in the right and at other times in the left flank; and even sometimes, being forewarned by the first appearance of these symptoms, and letting blood directly, they prevented the hæmoptoë which was just coming on.

It is not to be wondered, that patients who fear an hæmoptoe, or are terrified when this discharge of blood has already begun, should grow cold in the extremities, and that the veins of the hands should collapse; for this is the effect of fear, as was remarked on another occasion, §. 104. But it is also observed, that such a constriction in the extremities precedes other hæmorrhages, without any such terror: but this is very hurtful in an hæmoptoë, as the blood thus repelled from the extremities presses more violently on the vitals; for which reason Bennet<sup>e</sup> tells us, that it is almost always useful, either by friction or by gentle warmth, to recall the blood to the extremities. But that pain which precedes or accompanies an hæmoptoë, is generally very inconsiderable: nay, Galen<sup>f</sup> says, they who spit blood feel no pain, because the lungs are soft and have few nerves; which he thought were only distributed over the external membrane of this viscus, but did not penetrate the substance of the lungs: but soon after he makes some exceptions to this axiom, so that he affirms only, *thoracis dolores intensiores esse, pulmonis remissiores*; “that the pains of the lungs are mild, and those of the chest more intense.” The pain, however, in an hæmoptoë will be very slight, or perhaps there will be none at all, if the discharge be made by an anastomosis of the blood-vessels; for then the vessels suffer no violence, but only their orifices are gradually widened: whence Galen affirmed, that *the hæmorrhages caused by the rupture of*

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<sup>e</sup> Tabid. Theatr. p. 71.  
Charter. Tom. VII. p. 467.

<sup>f</sup> De Locis Affectis, lib. iv. cap. 3.

a vessel are accompanied with a pain which is felt in the part where the rupture is; and the same thing happens when this is caused by an erosion of the vessels: but such hæmorrhages as are produced by anastomosis, are altogether void of pain &c."

But the blood which is spit out generally is of a florid, scarlet colour, because it is arterial; and as soon as it comes into the bronchia, a cough being immediately occasioned, expels it, nor has it time to stop and coagulate there. When from a small vessel, either corroded or broken, a small quantity of blood only is discharged, it may stagnate, form itself into clots, and in that form be afterwards thrown out by a cough, as shall be said by and by: but that cough is seldom very violent in the time of an hæmoptoë, but is rather a slight tickling and irritation, because the fluid blood is easily thrown up from the bronchia. At the same time there is a wheezing in the lungs, as the air mixed with the blood issuing out, and inhering in it on account of the natural viscosity of the blood, is not readily extricated from it, and therefore the blood comes out from the lungs with a froth upon it. On this account, at §. 300. where we treated of the wounds of the thorax, the discharge of frothy blood, either from the wound, or spit up from the mouth, was mentioned among the signs which shewed that the wound had penetrated the cavity of the breast. Hence Hippocrates says, *When the blood spit out is frothy, the discharge thereof is from the lungs*<sup>b</sup>. Which Galen also confirms, where he treats of an hæmoptoë, and of the signs which shew from whence the blood proceeds: *Wherefore we should carefully observe whether any froth appears in what is spit up, for that is an evident sign that the discharge is from the lungs*<sup>i</sup>.

In

§ Ob ruptum vas sanguinis rejections cum doloribus fieri, qui rupturæ locum designant, nec secus quæ venæ erosione vel derosione, sive aliter quomodo libet nominare volueris, obortæ sunt; quæ vero per anastomosis fiunt, hæc omnino doloris sunt expertes. *Ibid. lib. v. cap. 5. p. 492.*

<sup>b</sup> Qui spumofum sanguinem expuunt, his ex pulmoneeductio sit. *Seft. v. Aphor. 13. Charier. Tom. IX. p. 201.*

<sup>i</sup> Quocirca diligenter considerare oportet, an spumofum simul quidpiam

In the mean time we must acknowledge, that there are other passages which seem to shew, that this frothy blood may also issue from other places. Thus we read in the Prænotiones Coacæ, *They who throw up frothy blood without any pain below the diaphragm, throw it up from the lungs*<sup>k</sup>. It is true, the word *εμεσειν* is used in the text; which, as it usually signifies vomiting, hence we may conceive, that the liver being obstructed, and the passage of the blood hindered through the vena porta, it flows back through the vasa brevia into the stomach, and afterwards is thrown up by vomit. At the same time we find that a copious discharge of blood from the lungs is called “vomiting blood,” especially by the poets, who used the expression *purpuream vomuisse animam* concerning those who perished by a wound piercing the breast. Thus we read also in Herodotus<sup>l</sup>, that Pharnuches being thrown from a startled horse who reared upright, *hic collapsus, sanguinem vomuit, et morbus transiit in tabem*; “he falling, vomited blood, and fell into a consumption:” in which place the vomiting of blood seems to mean an hæmoptoë, as that is usually followed by a consumption; and the word *φθισις* here used by Herodotus, in common acceptation, denotes a disease of the lungs. However, in other places, Hippocrates says expressly, *They who throw up frothy blood, and have a pain in the right flank, throw it up from the lungs, and many of them die*<sup>m</sup>: Afterwards<sup>n</sup> he repeats the same prognostic, and adds only, *moriuntur, they die.*”

These passages of Hippocrates, however, do not demonstrate that the frothy blood spit out comes immediately from the liver, but rather that the obstruction

piam educatur; id enim efficacissimum est indicium educationis e pulmone. *De Locis Affectis, lib. iv. cap. 8. Charter. Tom. VII. p. 467.*

<sup>k</sup> Qui spumofum sanguinem vomunt, dolore infra septum transversum non existente, de pulmone vomunt. N<sup>o</sup> 432. *Charter. Tom. VIII. p. 877.*

<sup>l</sup> Lib. vii. p. 408.

<sup>m</sup> Quicumque spumofum sanguinem spuunt, dextrum hypochondrium dolentes, de hepate spuunt, et multi pereunt. *Coac. Prænot. n<sup>o</sup> 408. Charter. Tom. VIII. p. 876.*

<sup>n</sup> Ibid. n<sup>o</sup> 450. p. 878.



tion of the passage of the blood through this viscus is the remote cause from whence the hæmoptoë follows. In the preceeding aphorism, it was shewn, that an hæmoptoë often arose from the suppression of any customary sanguineous excretions; now it would be using the expression in a less proper sense, to say a woman, who spit blood from her menses being suppressed, vomited blood from the uterus. All the blood, in its return from the abdominal viscera, must necessarily pass through the liver: if this viscus, therefore, labours under some obstruction, which impedes the passage of the blood through it, it should seem that spasms in the abdomen will ensue, which will repel the blood into the arteries; and thus, the other vessels being over-filled, an hæmoptoë may be produced; in which case, the blood which is spit out comes immediately from the lungs, although an obstruction of the liver may justly be esteemed the remote cause of this evil: but as in such a case the right flank is distended and painful, and sometimes also a pain is felt in other parts of the abdomen, as was said in the chapter where we treated of the Hepatitis, and the various kinds of Jaundice; we see the reason why Hippocrates mentions these symptoms of a pain in the left flank, and under the diaphragm. It is certainly very right to attend to all these things in the treatment of this disease. We read in Ballotius o, a very remarkable case of a young man of twenty, labouring under an hæmoptoë. “ The lungs (says this author) were thought to be in  
“ great danger, and all precautions were taken to se-  
“ cure them from being injured: by chance, on  
“ stroking the flanks gently, a pulsation, and as it  
“ were a kind of palpitation, was felt; and even the  
“ course of the blood running up from the hypo-  
“ chondria, and tending to the upper parts, was per-  
“ ceived, as tho’ it followed the motion of the hand:  
“ as it got upward, a shivering was felt, and present-  
“ ly the spitting of blood began: this discharge was  
“ instead of another hæmorrhage, which was frequent  
“ among young persons at that time. Suspending,  
“ there-

“ therefore, the remedies intended for preserving the  
 “ lungs, all the physician’s attention was turned to  
 “ the hypochondria; and the abdomen being well  
 “ cleansed by purges, the cause of this discharge of  
 “ blood was removed: Which is well worthy of note.”  
 Bennet <sup>p</sup>, observing the like symptoms in his practice,  
 (in which author, almost every thing that relates to  
 this disease is to be found) calls them *fluxions to the*  
*pectoral regions*; and warns us, “ that those fluxions  
 “ attend those most who have lost a limb, ~~or where~~  
 “ the remote parts are rendered impervious by the  
 “ obstruction of the small vessels.” Elsewhere, he  
 says, “ A fluxion caused by a stagnation, or difficult  
 “ passage of the blood through the vessels near the  
 “ heart, is more dangerous than that which is de-  
 “ rived upon the breast from more distant parts.”  
 Soon after he adds, “ The lungs are more endanger-  
 “ ed by a pressure arising from the passage of the blood  
 “ through the liver being obstructed, than from an  
 “ overflowing of the blood driven back upon them  
 “ from the obstructed vessels of the spleen.”

Aretæus <sup>q</sup> in the same manner tells us, that an hæ-  
 moptoë may proceed from a disordered spleen or liver:  
 but he adds, this is not easily or constantly produced  
 from such a cause, as these viscera can more readily  
 evacuate that which oppresses them into the stomach  
 and intestines. He adds, however, that it is neither  
 impossible, nor incredible, that they should discharge  
 themselves upwards, through the lungs and the artery  
 (meaning the aspera arteria); as in fevers, occasioned  
 by stoppages of the spleen and liver, an hæmorrhage  
 happens from the nostril, on that side in which the  
 viscus affected is situated.

We are to remark, that it is said in our text, that  
 the blood thrown up is *generally* of a florid and scarlet  
 colour; because it *sometimes* also issues forth grumous  
 and black, which happens, when, being collected in  
 a small quantity only in the lungs, it remains there  
 some time before it is thrown out: for if only a small  
 ves-

<sup>p</sup> Theatr. Tabid. p. 13, 106, 107.  
 Morbor. Acutor. lib. ii. cap. 2. p. 13.

<sup>q</sup> De Causis et Signis

vessel lets out the blood, a cough will not ensue immediately, the blood will lodge, and grow into clots; but, in a more violent hæmoptoë, it is spit out of a florid scarlet colour. When the ancient physicians observed such grumous blood spit out in small quantities, they suspected it not to come properly from the lungs, but rather from the chest, especially if there was a pain in any part of the breast. Thus we read in Galen as follows, *When a pain is felt in some part of the thorax, and the patient coughs, and spits up blood, and that not in large quantities, nor red, but black and grumous, the thorax is the primary seat of the disorder; but the blood is drawn through the lungs, as the pus is in suppurations, which we perceive by the feel to be lodged between the lungs and the chest: thus also the pus in pleuritic persons, appears tinged with different colours*<sup>r</sup>. Like observations are to be found in Trallian<sup>s</sup>. How the spitting in a pleurisy discharges the morbid matter, I have endeavoured to explain at large, §. 888, no 6. However, if no pain be felt in the chest, the spitting of such grumous blood in small quantities cannot be ascribed to such a cause, but the origin of it is rather to be sought in the lungs. It has been said already, that the ancient physicians enumerated three ways by which the vessels might let forth their contained fluids; namely, 1. A rupture from violence; 2. An erosion from acrimony; 3. Anastomosis, or such a dilatation of the orifices of the vessels, that they can let such fluids pass through them, as cannot be admitted to pass in the natural state of these vessels. Galen<sup>t</sup> adds to these a fourth way, which he calls διαπνοήσις, when the contained fluid, as it were, transudes through the unbroken membranes of the vessels: and he says, that this may happen when the coats of the vessels become thin-

<sup>r</sup> Quum igitur, dolente thoracis parte quapiam, sanguinem quis tussiendo rejecerit, neque multum, neque rubrum, sed jam nigricantem, grumosumque, huic thorax primaria affectione infestatur, at sanguis per pulmonem educitur ita, ut in suppuratis affectibus pus, quod inter thoracem et pulmonem sensus judicio contineri percipitur. Sic et pleuriticis sputum quovis modo coloratum apparet. *De Locis Affectis, lib. iv. cap. 8.*  
*Charter. Tom. VII. p. 467.*  
<sup>s</sup> Lib. vii. cap. i. p. 288.  
<sup>t</sup> Meth. Med. lib. v. cap. 2.  
*Charter. Tom. X. p. 105.*



thinner, and the blood is more dissolved, so as to pass through the pores of the vessels as through a sieve. Quicksilver gives no unapt instance of this διαπερναις, when it is squeezed through leather to purify it; for it transfuses in minute drops, the leather remaining intire: but although this may seem not altogether impossible, yet it is hard to conceive that the red blood, which is the most dense of the human fluids, should sooner force its way through the pores of the membranes of the vessels, than pass from the arteries into the veins. Galen <sup>u</sup> seems to have perceived this objection; for he presently subjoins, that a diapedesis may sometimes proceed from an anastomosis of the smaller vessels.

It is certain, from the experiments which were mentioned in the account of the Pleurisy and Peripneumony, that fluids injected into the pulmonary artery easily pass into the bronchia: the injection with wax into the arteries of the lungs, makes those vasculæ which creep over the whole surface of the air-vesicles of the lungs apparent to the eye. If some of these vasculæ be broken, or their extremities be dilated, they may effuse a small quantity of blood, which stagnating in these places is spit out afterwards in clots. But it is to be noted besides, that the cellular membrane is interposed, all over the lungs, between the branches of the trachea; and when the lungs are injected with wax, inflated, and dried, innumerable vessels appear distributed over the surface of this membrane: If now, either a rupture, or an anastomosis, happen among these small vessels, the blood collected there will not be spit out, but, stagnating on the outside of the air-vessels of the lungs, will make an ecchymosis, or effusion of fluids, such as happens in a bruise under the skin remaining whole, and is observed in the scurvy and other diseases wherein the vessels are corroded by the acrimony of the humours. It is true, that such effusions, especially when they proceed from some external force, are often gradually re-absorbed and disappear; but in scorbutic habits, they sometimes not  
only

<sup>u</sup> Ibid.

only remain a long time, but also frequently degenerate into obstinate ulcers: and it is to be observed, that blood effused in the lungs, is kept in by very tender membranes; so that if the fluid becomes more acrid by stagnation, or from its quantity distend these membranes beyond their strength, then, bursting them, it finds a passage into the bronchia: whence we may conceive another cause of spitting grumous blood. Bennet seems to have suspected this very thing: for when he speaks of the acrimony of the humours, he says, this is not only pernicious by altering the crasis of the blood, but these acrid humours “ break the confines “ of the vessels \*.” And he adds, “ That the vessels, irritated by this acrimony, endeavour to free “ themselves from it, and that generally by an hæ- “ morrhage: which, if it happen in the vessels of the “ lungs, causes either an hæmoptoë, the forerunner “ of a phthisis; or an ecchymosis: for nature has closed the veins and arteries through the whole internal cavity of the body with membranes, by which “ she set bounds to the circulation, as well as by the “ external covering of the skin. If the blood extravasated from the vessels of the breast, lodge in these “ membranes, such an effusion may properly be called an internal ecchymosis.” At the same time it appears, that if the blood extravasated by such means becomes acrid by long stagnation, the larger vessels may in time be corroded by it; and thus, after clots of blood have been spit up, a large quantity of fluid blood may be thrown up by a violent hæmoptoë; which Galen † has also observed: nay, he says, that there has been so great an erosion in some cases, *ut non pauci sic affecti pulmonis quasdam partes, una cum sanguine, e- jecerint*, “ that many persons have spit up pieces of “ the lungs together with the blood.”

Among the signs of an hæmoptoë from the lungs, he reckons this as one: *Si quis bronchii partem quandam, aut arteriæ, aut venæ tunicæ, aut etiam pulmonis ipsius carnis ejicial*; “ if a person spit some part of  
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\* Theatr. Tabid. p. 95, 96. † De Locis Affectis, lib. iv. cap. 8.  
Charter. Tom. VII. p. 466, 467.

“ the bronchia, or of the coat of an artery or vein,  
 “ or of the fleshy substance of the lungs themselves.”  
 And elsewhere<sup>z</sup> he asserts the same thing; and avers,  
 that he has seen a considerable portion of a vessel spit  
 out in coughing, which, by its size, plainly shewed  
 that it came from the lungs, as the trachea has no ves-  
 sels so thick. Elsewhere<sup>a</sup> he relates, that he saw a  
 youth of eighteen, who, after having been afflicted  
 many days with a cough, began first to spit up warm  
 florid blood in small quantities, and afterwards a part  
 of the membrane which lines the internal surface of  
 the aspera arteria; from the thickness of the mem-  
 brane spit up, and from what the patient felt, he be-  
 lieved it to have been part of the internal coat of the  
 larynx. He observes also, that his voice was much  
 injured by this accident, but that the patient recover-  
 ed after a long time. In another place, in which he  
 appears to relate the same accident<sup>b</sup>, he says, that  
 though the disease was cured beyond hope, yet the  
 voice remained affected by the misfortune. Observa-  
 tions of similar accidents are to be found in Tulpus;  
 in one of which cases an entire vein of the lungs was  
 spit up, and he gives two figures describing it: And a  
 physician whose lungs had long been weak, after tak-  
 ing an antimonial emetic, threw up a large piece of  
 the lungs, and presently expired. Tulpus<sup>c</sup> has also  
 given a figure of this piece. A like history is to be  
 found in the Acta Eruditorum<sup>d</sup>, with a figure describ-  
 ing it, by an anonymous author; who however, at  
 the end of his account, candidly confesses, “ that al-  
 “ though the texture of this substance, which was an  
 “ hand’s-breadth long, inclined him to conjecture  
 “ that it was part of the pulmonary vein; yet at the  
 “ fissure of it, at the part where it was probably sepa-  
 “ rated from the larger trunk, there appeared a fleshy  
 “ substance, not unlike a polypus, which was proba-  
 “ bly the cause of this unhappy accident.” Tulpus,  
 with

<sup>z</sup> Ibid. lib. i. cap. 1. ibid. p. 379.

cap. 12. Charter. Tom. X. p. 123, 124.

lib. i. cap. 1. Charter. Tom. VII. p. 379.

Med. cap. 12, 13, 14.

<sup>a</sup> Meth. Med. lib. v.

<sup>b</sup> De Locis Affectis,

<sup>c</sup> Lib. ii. Observat.

<sup>d</sup> Anno 1683. p. 218, 219.



with other physicians, greatly wondered that the parenchyma, or fleshy substance of the lungs themselves, could be so dissolved without a previous suppuration, that such a branch of the vessel should appear quite unconnected and unadhering to the substance of the lungs, “as though some anatomist had leisurely cleared away every part of the surrounding viscus which any where adhered to it.” And he was the more confirmed in his opinion, by seeing the separated veins publicly examined by his master Peter Paw, formerly a celebrated anatomist. Hence he looked on this as a miracle before unheard of, the account of which posterity might contemplate with wonder, although they were not likely ever to see such another instance, or to read of any such in the records of physic. Thus far Tulpius. But certainly Galen had seen like accidents many ages before, and many such have been observed since Tulpius. Ruysch<sup>e</sup>, a more accurate examiner, mentioning a polypus found in the longitudinal sinus, which, when dried, resembled a vein, adds the following caution, “By which resemblance, many have been deceived, with regard to accidents from disorders of the breast, when, having thrown up polypuses of this kind by coughing, they think they have spit out a vein.”

Certainly it is not altogether improbable, that the lungs may be lacerated by a wound, or some other violent cause; and that some pieces of the lungs thus lacerated, may be thrown up: but when no such causes have preceded, such an accident is very unlikely. Such polypous concretions are sometimes spit out after a very violent hæmoptoë: but the blood in this case is effused into the bronchia; and, unless it be presently spit out, it will coagulate there, and readily assume the form of the vessel in which it has lodged; and the longer such a polypus stays there, the more dense it becomes, and sometimes grows entirely white. If now we reflect, that the patients, on account of their weakness from loss of blood, or by the advice of a physician, keep quiet, abstain from speaking, and suppress their cough

as much as possible, it is not at all strange, that part of the blood, fallen upon the bronchia, should coagulate into a polypous substance, and after some time be thrown out by a cough, especially if the hæmoptoe return. This, I think, explains Tulpius's unheard of miracle.

To the same origin we may refer those membranous bodies which are spit up sometimes after the hæmoptoe. A peasant, thirty years old, was seized with this complaint; and by taking alum, and some styptic liquor given him by a physician, the spitting of blood was stopt: but on his asking my advice, two months afterwards, I thought there was cause to fear an ulcer of the lungs, as he had a constant slight fever, and his saliva was purulent, thin, and tinged with blood. I prescribed mild, detergent, and balsamic remedies; and he came back to me about a month afterwards, quite free from fever and cough: but he shewed me a membraneous substance, tolerably thick, which he had thrown up in coughing, greatly to his relief. I was able to divide this concreted substance into thin lamellæ, which, on examining them with the best microscopes, I found to be perfectly homogeneous; nor could I discover any thing fibrous or organic in their texture.

Kaau, in his book *de Perspiratione Hippocratica*<sup>f</sup>, relates a wonderful case of Dringenberg, a very skilful surgeon at the Hague, who without any preceding hæmoptoe, without a fever, difficulty of breathing, pain, or any other symptom, besides a gentle cough, spit up an incredible quantity of matter concreted in the bronchia and having the figure of those vessels.

But when the lungs are suppurated, it is not unlikely that solid pieces of this viscus may be separated from it and spit out: but these are usually of a small size. Thus Bennet, when he is describing the signs of a very bad consumption, which baffles all the physicians skill, says, after the excretion of pus of the worst kind, "small shreds torn from the lungs, their vessels, and  
"membranes, are thrown up<sup>g</sup>." What occasioned

Tul-

<sup>f</sup> P. 114, et seq.

<sup>g</sup> Tabid. Theatr. p. 104.

Tulpius's astonishment was, that so great a dissolution of the parenchyma of the lungs should be effected without previous suppurations.

The pulse is slow, soft, and fluttering, at the time of an hæmoptoë; because the blood which comes from the right ventricle, passes, diminished in its quantity, to the left ventricle, as part of it is effused into the air-vessels of the lungs: At the same time it is to be considered, that men are generally terrified when they find themselves spit blood, which also occasions a panting; which yet is caused by the blood effusing itself on the bronchia.

A brackish taste in the mouth frequently precedes an hæmoptoë, especially when this is caused by an erosion of the vessels from too great an acrimony of the humours. It appears from what has been said before, that this is sometimes a saline acrimony: And we shall afterwards see, in treating of the cure of a phthisis, that a sweat, excited by proper remedies, is sometimes of use; which sweat, descending down the face to the lips, has manifestly a salt taste. Bennet gives us the following remarks: "In every evacuation of blood  
 " upwards, the drops which come out in the beginning of the hæmorrhage are saltier, and those which  
 " succeed are of a sweeter taste, as every one may  
 " find by his palate who has ever coughed up blood<sup>h</sup>." Certainly, when a saline acrimony abounds in the blood, it is not strange that the saliva, which is a fluid secreted from the blood, should have a salt taste. Besides, we find, that, in the beginning of a coryza, there distils from the nostrils a thin humour, which is evidently salt, and frequently occasions pain and excoriation of the inside of the nostrils, and of the upper lip. We observe like things happen in the lungs, when a catarrh falls on the breast, from whence a troublesome and painful cough is excited, and then a thin and sharp saliva is spit out: but when either spontaneously, or by means of a mild diet, and remedies of the like kind, that acrimony is softened, then the coryza and catarrh are ripened, and a well digested bland matter is excre-



ted from the nostrils, and thrown up by spitting. If now such a symptom appear in a body inclined to an hæmoptoë, there is reason to fear such an hæmoptoë will break forth when this brackish taste has preceded. Bennet remarked, as was mentioned in the preceding paragraph, “ That persons subject to an hæmoptoë, “ are most in danger of its returning when it snows, “ or hails, or in rainy weather;” now these kinds of weather chiefly promote coryzas and catarrhs.

It is also to be noted, that although the tongue be the principal organ of taste, yet that tastes have been found to arise from causes residing in other parts of the body: thus from acrid bile collected in the stomach, a bitter taste is perceived in the mouth, as was noted in the history of fevers; perhaps also a salt humour, secreted from the pulmonary arteries into the bronchia, may excite a salt taste in the mouth; and this seems probable, especially from the remark quoted from Diemerbroeck, §. 888. where we treated of the cure of a pleurisy by spitting, *viz.* that after bitters had been injected into the cavity of the thorax, by means of the paracentesis, the patients perceived a bitter taste.

§. 1200. **A**N hæmoptoë is cured, 1. By copious bleeding every third day, for four times, or till the inflammatory crust entirely disappears. 2. By cooling, thickening, styptic, softening medicines, long continued, and mixed now and then with the mildest balsamics. 3. By so regulating the fix non-naturals, as to make them contrary to the causes of the disease enumerated at §. 1198. And, 4. By correcting the specific nature of the cause, or particular disease which has occasioned it.

We are next to consider the cure of an hæmoptoë, which will be discussed under the four following heads.

1. All physicians sufficiently agree in the necessity of bleeding in this disorder; and that at the very beginning,

ginning, when the patient first spits blood: It will be still better, if the physician, foreseeing an impending hæmoptœ from the symptoms above enumerated, *prevents* it by a timely bleeding; but we are now supposing the disease already present.

Bleeding is adviseable in an hæmoptœ for two reasons; namely, that the quantity of the blood may be lessened, and by that means the vessels be less distended, and, the blood returning through the veins in a smaller quantity to the heart, the heart itself may contract less forcibly; and also to prevent an inflammation.

Before, in treating of wounds, it was observed, that some persons had recovered after very dangerous wounds, even of the larger arteries, when they were reduced to the greatest weakness from the violent effusion of blood, and were even left for dead: life, however weak, still remained, and thus an opportunity was given for consolidating the torn artery. At §. 161. a surprising case was related of a man, whose right axillary artery was cut with a knife; who recovered, after having been left for dead. Now a vessel broken in the lungs, will have the whole force of the right ventricle impelling the blood upon it: Unless the action of the heart therefore be weakened by bleeding, the hæmoptœ will be perpetuated; and there will be a danger, lest, the hiatus of the broken vessel being enlarged, the patient should die of a sudden effusion of blood: wherefore, Hippocrates <sup>a</sup> advises, that we should prevent this disorder before the hæmorrhage begins, and the hiatus of the ruptured vessel is considerable; and if this be done, he says, the patient may recover. Trallian <sup>b</sup> approves bleeding, when the hæmoptœ is occasioned by a rupture of the vessels; but condemns this practice in an hæmoptœ arising from an erosion of the vessels, because, in this case, the patients are dry and emaciated <sup>c</sup>. But it is easy to see, that there is the same danger of the hæmoptœ being profuse when the vessel is corroded, as when

<sup>a</sup> De Morbis, lib. i. cap. 6. Charter. Tom. VII. p. 536. <sup>b</sup> Lib. vii. cap. 1. <sup>c</sup> De Morbis, lib. vii. cap. 1. p. 296.

when it is broken ; and therefore that the same indication takes place. It is true, indeed, that more copious and frequent bleeding is necessary for persons of a robust and warm constitution, than for those who are weaker ; but is, however, necessary for these also, in order to prevent the further laceration of the torn vessel : but when so great a quantity of blood comes forth in an hæmoptoë, as that the *vis vitæ* becomes very languid, it is sufficiently plain that bleeding is not necessary ; because that very disposition of the body exists, which it is the design of bleeding to produce. If therefore the face, lips, and eyes, have lost their colour ; if the pulse be weak, the extremities cold, and the veins appear to be collapsed ; the strength is then sufficiently weakened, and the hæmoptoë will cease, unless the hiatus of the corroded or lacerated vessel in the lungs be so great, that all the blood issues by the passage, and death ensues. It is, however, to be remarked, that in persons taken with a spitting of blood, this paleness sometimes proceeds from the terror with which they are seized, although they spit up but a small quantity of it : but this paleness is soon removed, and the collapsed vessels become visible again, if the physician raises the patient's spirits by encouraging expressions ; and in this case bleeding is still proper.

An hæmoptoë generally abates after bleeding ; nay, often quite stops ; unless some large branch of the pulmonary artery be torn or eroded : but as there is reason to fear its return, it will always be adviseable to repeat the bleeding ; but how often, at what intervals, and in what quantity, can only be determined by the particular symptoms, which the physician will be the best judge of. I am guided by the following circumstances. If the hæmoptoë ceases after the first bleeding, and the patient feels no pain in his breast ; if the pulse be regular and slow, but not full ; if the heat of the body, especially of the extremities, be less than in sound health, and the breathing free and easy ; I defer a second bleeding for three or four days : But when the pulse begins to grow full, and the heat of the body equals or exceeds that  
of



of a person in health; if there be a tension, or an obtuse pain felt in the chest, or if the cough grows worse; I repeat the bleeding immediately, even if these symptoms appear but a few hours after the first bleeding: for the whole intention is to diminish the quantity and impetus of the blood, that the ruptured vessel may be united, and the cicatrix now formed may not be broke open again. Hence it is sufficiently evident, there can be no universal determinate rule given, but that a constant attention is requisite to what passes in the patient. I confess, that I have sometimes observed that inflammatory crust, which was mentioned in the history of the pleurisy, also in the blood of persons taken with an hæmoptoe: but however, it does not frequently appear, although the symptoms enumerated above call for repeated bleeding. Besides, we are not entirely certain what this inflammatory crust or size upon the blood is: if, for instance, the blood let out of the vein be put in three basons, this crust appears in the first bason and not in the rest; sometimes it is to be seen only in the second and third bason, although the blood has flowed from the orifice in a full stream. I have seen a man who threw up a very large quantity of blood in an hæmoptoë: this blood was received in a bason, and no crust appeared upon it; whereas, his blood drawn from the vein by the lancet, had a very thick and tough crust upon it. So that this does not appear a certain sign, by which to regulate our proceedings in the cure of an hæmoptoë. Generally, as Sydenham<sup>d</sup> tells us, bleeding frequently repeated is of service in the cure of this complaint; but the direction of it must be left to the judgment of the physician. It will always be safer, rather to exceed in lowering the patient's strength, than to run the risk of a return of the hæmoptoë.

But bleeding is serviceable on another account. It is certain, that the ancient physicians apprehended very great danger when an inflammation or fever accompanied or followed an hæmoptoë: and with very good reason; because, in those circumstances, an ulcer

cer of the lungs, and an incurable consumption, might be expected. It was said before, (§. 1198.) that Galen almost despaired of a cure, when an inflammation came on in an hæmoptœ. Aëtius <sup>e</sup> likewise insists strongly on the necessity of trying all means to cure the wound in the lungs while it is fresh, before it begins to be inflamed: for if an inflammation once comes on, there is little hope of closing the wound, and the cure of the disease will be greatly protracted; for the pus and ichor must be cleansed away after the inflammation is subdued, and the patient must afterwards be treated as a person in a consumption. A like remark is to be found in Hippocrates; *It is happy for those who spit blood to be without a fever, and to have a slight cough, and but little pain, and that what is spit up should be thin for fourteen days; but to be feverish, and to cough violently, and feel great pain, and always to spit fresh blood, is pernicious* <sup>f</sup>. But from what has been already said in the history of inflammations and acute inflammatory diseases, it is evident that bleeding is of excellent service in such disorders; and at §. 610, it was proved, that bleeding greatly conduced to moderate the vehemence of fevers: The usefulness therefore of bleeding in an hæmoptœ, is sufficiently apparent.

2. The impetus and quantity of the blood being thus reduced by venesection, we are next to direct the medicines that are most proper for the cure of an hæmoptœ. Mention has already been made, at §. 218. of such remedies as stop an hæmorrhage from a wound; but it easily appears, that the greater part of these can have no place in this disorder, in which the surgeon's hand can have no access to the injured part. Astringent remedies appear almost the only suitable ones; but then the difficulty is how to convey their efficacy to the part affected, and to it only; For these remedies act either by inspissating the fluids,

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<sup>e</sup> Lib. viii. cap. 69. p. 171, versa.

<sup>f</sup> Sanguinem spuentibus confert, ut sint sine febre, et tussiant ac doleant levitur, et ut sputum tenue fiat ad dies bis septem. Febricitare autem et tussire ac dolore vehementer, et sanguinem recentem semper spucere, damnosum. *Coac. Prænot.* n<sup>o</sup> 427. *Charter. Tom. VIII.* p. 877.

or by astringing the solids, or by both these effects combined; and although their whole efficacy could reach the lungs, certainly they would not only act upon the broken vessel, but on all the other vessels; so that, by inspissating the fluids and contracting the vessels, the free motion of the blood through the lungs would be impeded, and a mortal peripneumony soon ensue. But such consequences are here little to be apprehended from the use of astringents, because they cannot be applied immediately to the lungs; but after being swallowed, they must be taken in by the absorbent vessels of the stomach and intestines, and thus come slowly, and much diluted, to the part affected. But then, on the other hand, it is easy to perceive, that very inconsiderable effects are to be expected from their astringent and inspissating qualities: for they act first with their whole force on the *primæ viæ*; wherefore, if they be very powerful, they will, by causing the mouths of the absorbents in the intestines to contract, stop up the passage against their own entrance into the blood, until, either by fluids taken as common drink, or by the humours perpetually flowing to the stomach and intestines, they are so diluted as to be no longer able to contract the tender and narrow orifices of the veins, whose mouths open into the intestines; and thus they may gain admittance, as it were, by stealth, and greatly weakened and diluted, into the blood. On this account, physicians do not trust much to astringents: although they prescribe them, that they may not appear to neglect any means that may be of the least service to the patient; especially as the prudent use of them is very innocent and safe; for if they do little good in this disorder, they will not do much harm, as the principal bad effect of strong astringents is to be feared in the *primæ viæ*: wherefore physicians are used to order such remedies in a small dose, frequently repeated, when the symptoms indicate the use of them; but of the milder kind, such as the bole armoniac, terra sigillata, blood-stone, and the like §. In the *Materia Medica* of our author,

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§ Alex. Trallian, lib. vii. cap. 1. p. 300, et seq.



under this aphorism, various forms of this kind are to be found. Trallian extols the *lapis hamatitis*, or blood-stone, ground to a very fine powder, of which he gave 4 scruples; and continued the use of it for a long time: for he tells us, that one of his patients at last grew tired of taking it; upon which he tied the powder in a linen rag, and steeped it in a sweet-scented wine, and afterwards gave the patient the wine with good success, as the whole body was strengthened by it. He adds, “ that after the patient had recovered  
 “ from his disorder, he continued the use of this  
 “ wine, till he found his strength to be so far restored, as that he was capable of doing all his usual  
 “ business.” Now we know that the blood-stone is the pure ore of iron; which therefore, when steeped in wine, possesses all the corroborating qualities of steel, by which the weak solids are rendered firm, and the dissolved fluids compact, as was said §. 28. And above, at §. 1198. among the pre-disposing causes of an hæmoptoë and phthisis, was reckoned that state of the body in which the vessels are weak, and the blood dissolved and thin. For a like reason, it should seem, that Morton commends the bark: For although he says, “ that it soon safely stops the hæmoptoë when prevented, and prevents it when it is apprehended<sup>h</sup>;” yet he appears to have expected more from the corroborating quality of this medicine for the prevention of an hæmoptoë, than for the immediate stopping this discharge when it is begun; as is plain from what he says in the rest of the chapter, and the cases of patients annexed to it: and at the same time he observes, that by the use of this remedy, the body is gradually restored to a robust and athletic state. Brunner<sup>i</sup> confesses he did not believe what Morton had said of the efficacy of the bark in an hæmoptoë, till he found the truth of it by experience; and particularly in a thin man, subject to a bleeding at the nose, and afterwards troubled with a spitting of blood; at first, only in spring and autumn; but in time, the returns of the

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<sup>h</sup> Phthisiolog. lib. iii. cap. 5. p. 96.  
 p. 101.

<sup>i</sup> Glandul. Duod. cap. 5.

complaint grew so frequent, that he was scarce ever free for a day from spitting of blood, and his body was beginning to waste: various remedies, and among the rest, goats milk, having been used, without success, he gave him the bark; after which the hæmoptoë stopt in a few days, and the man recovered his health: and he says, he afterwards found the bark equally successful in a bleeding at the nose.

But it is sufficiently evident, that such an efficacy of the bark is not meant in these instances, as that it instantly should stop the blood rushing from a broken vessel of the lungs in a full stream; but rather that virtue of this medicine, by which it corrects the disposition of the body, both in the solids and fluids, which renders men liable to an hæmoptoë, of which we treated §. 1198. But the inquiry now properly is, what remedy our art knows, by the use of which we may hope presently to stop a profuse spitting of blood. For as to a slight hæmoptoë, that generally yields to bleeding, accompanied with rest of body and mind: and it but seldom happens that persons die by the violence of this complaint; for it much oftener turns to a consumption, which brings on death by slow degrees. But as it sometimes happens that men are in instant danger of losing their life by a profuse spitting of blood, it will be worth while to see what art has attempted in such a case.

Celsus <sup>k</sup> tells us, that Erasistratus applied ligatures to the legs, thighs, and arms, in several places: by this means the veins being compressed, a considerable part of the blood is retained in the limbs, and a less quantity returns to the heart; and thus time is given for the broken vessel gradually to contract itself. And altho' Asclepiades condemned this practice as hurtful, yet he adds, "But experience shews that they often answer the intention."

Bennet <sup>l</sup> however, a writer of great authority on this disease, says, "That ligatures are often unsuccessful; but that frictions of the extremities, and moderate warmth, have been of service." Of this we made

<sup>k</sup> Lib. iv. cap. 4. p. 204.<sup>l</sup> Tabid. Theatr. p. 71.

mention also in the preceding paragraph. Some physicians have thought of applying styptics to the ruptured vessel itself; but as this can only be done by steams, and the virtues of astringents being of a fixed nature, little good can be expected from them. Alcohol of wine is accounted styptic, and retains this quality, even when dissolved into steams; but such a hot and acrid steam would irritate the lungs, and produce a violent cough, which is dangerous in this disease. Balsam of Tolu conveyed to the lungs in the form of a vapour is recommended by Dr Mead <sup>m</sup>; but by this also there is danger of exciting a cough. Bennet <sup>n</sup> recommends fumigations, but not for stopping the hæmoptoe, but rather for cleansing the ulcer; for he adds expressly, “Fumigations should not be applied immediately on an erosion of the vessels or of the substance of the lungs, but about a fortnight after the spitting of blood has ceased.”

When we treated of a delirium in fevers, as also of the epilepsy, it was shewn, that the cause which disturbs the operation of the brain may sometimes reside in distant parts of the body, and that remedies may very successfully be applied to those places where the root and origin of the evil exists. On this account, practitioners have thought that a spitting of blood might be stopped, although the remedy was not applied to the lungs, but to some other part of the body. Hoffman has a remarkable passage to this purpose. “It is wonderful, (says he,) that a strong styptic taken inwardly very speedily operates on different parts, and by contracting them puts a stop to profuse hæmorrhages; thus in an hæmoptoe, and an immoderate flux of the menses, the eruption of blood has soon stopt after taking tincture of sulphur, vitriol, or blood-stone <sup>o</sup>.” I have seen a violent bleeding at the nose stopt, by applying linen, four times doubled, wet with cold wine and water, to the scrotum; presently after, the patient had a shivering all over, and the bleeding stopped. These instances

<sup>m</sup> Monit. et Præcept. Med. p. 53.

<sup>n</sup> Tabid. Theatr. p. 126.

<sup>o</sup> Pathol. Gener. parte iii. cap. 6. sect. xi. Tom. II. p. 416.



ces seem to make it not improbable, that a spitting of blood from the lungs may be diminished, or even stopped, by applying remedies to other parts of the body. But we have not yet learnt by certain experiments what are the parts of the body to which these remedies must be applied: and it is easy to foresee, how difficult it must be to give immediate relief, as the whole force of the neighbouring right ventricle of the heart urges on the blood through the vessels of the lungs, and the torn vessel makes less resistance than the other branches of the pulmonary artery: besides, a man who spits up blood in a large quantity is struck with a sudden fright; which makes the pulse grow quick and irregular, as Galen<sup>p</sup> observes; and therefore the motion of the heart is also accelerated. Physicians have remarked, that styptics succeed better when experiments are tried on brutes than on men; because brutes are ignorant of the danger, whereas wounded men are alarmed and disturbed: but if this perturbation be quieted by an opiate, the same effects are often found from styptics in men as in brutes<sup>q</sup>.

In urgent cases, physicians have sometimes ventured to try another method, which, though it seems dangerous, has often proved successful: They gave the patient cold water to drink, when they apprehended present death from a violent spitting of blood. There is a remarkable passage in Galen, where, after he having treated of common hæmorrhages, he turns his discourse to such as arise in the cavities of the body. His words are: *The blood flowing from vessels may be stopped, either because fresh blood does not flow to the part; or because the hiatus is closed; or for both reasons, which is best of all: wherefore a bleeding may cease, either from a fainting fit, or by a revulsion, or derivation, or refrigeration, either of the whole body, or particularly of the wounded part; it is thus that drinking cold water often suppresses hæmorrhages, and the same effect is pro-*

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<sup>p</sup> De Puls. ad Tyron. cap. 12. Charter. Tom. VIII. p. 8.

<sup>q</sup> Schwencke Hæmatolog. p. 37, 38.

duced by throwing cold water on the body<sup>r</sup>." And it appears from the following chapter, that this use of cold water was customary among physicians for stopping hæmorrhages; although Galen does not at all approve of it. For he says, *But as to those astringents, or such things as act only by cold without being astringent, and which are applied immediately to the part affected, I do not (as most physicians do) approve of them always: such applications seem to me contrary to what the case requires, to drive the blood inwards, and to fill the vessels which lie deep in the body; for we have seen many of those who spit up blood from the lungs, much hurt by the thorax being affected with cold<sup>s</sup>.* Hippocrates indeed seems to commend cold, when he says, *Cold things may be of use when blood is spit up, or when this is expected, not applied to the parts themselves, but only near the parts from whence the blood issues<sup>t</sup>.* And certainly, if we consider what was said (§. 881.) concerning the drinking cold liquors hastily, and in large quantities, when the body is heated, as being a frequent and dangerous cause of the pleurisy, it will appear that drinking cold water may be of use in an hæmoptoe, according to this aphorism: For the cold is not applied immediately to the lungs, from the vessels of which the blood flows; but rather to those parts from whence the blood passes into the lungs. For the stomach, which receives the cold liquor, touches the tendinous part of the diaphragm, which is so near the heart, the ascending trunk

<sup>r</sup> Qui igitur e vasis profluit sanguis, aut quod amplius non confluet sistetur, aut quod occlusa divisio erit, aut etiam propter utrumque simul, quod puto optimum est. Porro confluere prohibetur et propter animi deliquium, et revulsionem, et derivationem, et refrigerationem, tum corporis totius, tum præcipue ipsius partis vulneratæ. Hac enim ratione etiam frigida pota sæpe hæmorrhagias suppressit, idem facit et frigida foris effusa, &c. *Metb. Med. lib. v. cap. 5. Charter. Tom. X. p. 3.*

<sup>s</sup> At vero quæ extrinsecus parti sanguinem profundenti admoventur, tum adstringentia, tum citra astrictionem simpliciter frigida, hæc ipse (veluti plerique medicorum) non ubique probo; sed mihi contra omnino, quam fieri res postulat, ipsum sanguinem intro compellere, ac venas quæ in alto sunt implere videntur. Vidimus enim quosdam eorum qui ex pulmonibus sanguinem rejicerent, ex thorace refrigerato manifeste læsos, &c. *Metb. Med. lib. v. cap. 6. Charter. Tom. X. p. 112.*

<sup>t</sup> At in his frigido uti oportet unde sanguis profluit aut profluxurus est, non supra ipsas partes, sed circa ipsas unde profluit, &c. *Sed. v. Aphor. 23. Charter. Tom. IX. p. 208.*

trunk of the vena cava, and the right ventricle of the heart : Now the blood contained in the vena cava and right ventricle is soon after to be propelled into the lungs ; and if it can be condensed by the cold of the water poured into the stomach, it will less easily pass through the wounded vessel, and there may be hopes that a clot of grumous blood may be formed, which will stop the hiatus of the vessel ; and thus a dangerous hæmoptoë may be checked, and time may be given for healing the wounded vessel, if at the same time other necessary cautions be observed, part of which have been already, and part will soon be mentioned. It is true indeed, that there may seem room to apprehend, that the same coagulation may take place in other vessels of the lungs ; but the very action of the vessels may overcome this condensation caused by cold, as it is not of long standing ; and yet some effect may be expected in the wounded vessel, as in that part the vessel has no action. And the danger lest the blood congealed by cold should suddenly stop in the narrow extremities of the pulmonary artery, seems to be diminished by this consideration, that the cold water is not suddenly thrown in large quantities into a robust body heated with fatigue, but into a body already weak with great loss of blood ; and in which the vessels are soft, and the blood mostly dissolved and thin, as was noted §. 1198. It must be confessed, however, that Hippocrates, in the next aphorism <sup>u</sup>, condemns cold things, such as snow and ice, as being adverse to the breast, exciting a cough, promoting hæmorrhages, and causing catarrhs. Bennet's observation agrees with this admonition of Hippocrates : " Snow, hail, and " rainy weather, are the most dangerous for persons " subject to an hæmoptoë <sup>v</sup>." But it is to be considered, that we are not speaking here of such things as may occasion an hæmoptoë, but of a remedy which may be able suddenly to stop a dangerous hæmoptoe, that time be gained for applying safer remedies : For no wise man will give too large a quantity of cold water in such a slight spitting of blood as may be cured

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<sup>u</sup> Ibid. p. 209.

<sup>v</sup> Tabid. Theatr. p. 109.



by other methods: but doubtful remedies may be tried in very dangerous cases; and the rule of Hippocrates is good, "That extreme disorders require extreme remedies."

But although it be the part of a prudent physician to weigh very carefully whatever is proposed to be done in the cure of diseases, yet the doctrine of the *juvantia* and *lædientia* has great weight in practice, and is of more force than all arguments drawn (according to the scholastic term) *a priori*. Hoffman <sup>w</sup>, treating of the hæmoptœ, confesses, that drinking cold water by little at a time, but so as to drink a considerable quantity of it every day, the body being well covered, has sometimes cured a dangerous flux of blood of this kind, especially when the body has much internal youthful heat; "which heat the cold water  
" repressing, and exciting a warm moisture on the  
" surface of the body, carries off by sweat the hot sulphureous particles which caused the effervescence of  
" the blood."

On another occasion, (§. 1069.) speaking of the cure of a palsy, we observed, that on applying cold water there arises a shivering and shaking all over the body, but that this is soon succeeded by a warmth over its whole surface; and that, if the patient goes to bed immediately, a profuse sweat generally breaks out; and thus the perspiration being increased through the pores of the skin, the vital parts are relieved. Bennet endeavoured, by friction of the external parts, to augment the motion of the fluids in the cutaneous vessels, with a view to stop an hæmoptœ: but friction, when long continued, increases the motion of the blood all over the body, which does not seem expedient in this disorder. This author indeed condemns cold applications: "If (says he) a person taken  
" with a spitting of blood, or with a bleeding, be dip  
" in a cold bath, the bleeding will increase; but aug  
" menting the heat on the surface, and in the extre  
" mities of the body, is of service <sup>x</sup>." But as it is known,

<sup>w</sup> Sect. i. de hæmorrhagiis, cap. 21. Tom. IV. part ii. p. 38.

<sup>x</sup> Tabid. Theatr. p. 71.

known, that from the application of cold water both internally and externally, if the body be well covered, there will follow a warmth on the skin, and even sweating; it appears that what Bennet wanted to obtain for stopping an hæmoptoë, is procured by the use of cold water; and at the same time the ebullition of the blood (in the heat of youth especially) is cooled by it, as Hoffman observed.

Some celebrated physicians in Italy have shewn the happy effects of cold water boldly given in the cure of an hæmoptoë. Martin Ghisi<sup>y</sup>, who practises with great success in Cremona, among other useful observations, relates the case of a very robust man in the hospital, who threw up suddenly three pints of blood. He immediately gave him water made extremely cold with ice, with so good effect, that the hæmoptoë stopt almost entirely, and the patient kept well for three days; when the hæmoptoë returning with violence, he was instantaneously suffocated: But it was owing to his indiscretion; for he eat largely of some roast meat, and drank a great quantity of some strong wine, which his wife had privately brought to him. He mentions another case of a youth, who had a frequent spitting of blood, attended with a fever; after trying repeated bleedings and other remedies unsuccessfully, he gave him ice-water, a cup of which he was to drink every quarter of an hour at least. In a few hours the hæmoptoë ceased, the fever and cough abated, and in a few days he perfectly recovered.

After this, Ignatius Gervaseus a Monte Faleasco<sup>z</sup>, a celebrated physician at Rome, confirmed this method of cure. He not only gave cold water to drink, but when the case was urgent, he applied sponges dipped in cold water to the naked breast, and ordered a thin cool diet. Many histories of spittings of blood cured by this method are to be found in his treatise, and he declares he has seen many more such cures than he relates.

At the same time he forbade giving warm broth to the

<sup>y</sup> Lettere Mediche in 4to, Cremon. 1749. p. 22, et seq. <sup>z</sup> De usu aquæ frig. in hæmoptoe, &c. in 4to, Romæ 1756. p. 78, et seq.



the patients; for he had observed, that this increased the cough, and brought on again the hæmoptoe. Tral-  
lian had before given this caution: "It is not expe-  
dient (says he) to give the patients warm drink or  
hot victuals; but all they eat and drink should be  
temperate, or rather inclining to cold <sup>a</sup>."

It will perhaps seem strange, that a cough should be relieved by cold things, as cold is enumerated among the causes of a cough by Hippocrates and by almost all physicians. Nevertheless such cases are to be found in medical history as prove this. A man was troubled for three months with a violent cough: after several remedies had been tried in vain, he fell by accident from a bridge on frozen water: he broke the ice by his fall, and was plunged up to the chin in the water: when he had got out, and returned home, he put on a warm shirt, eat some warm broth, and slept quietly all night: the next morning he was surprised to find that his cough was almost gone, and in a few days after it entirely ceased <sup>b</sup>. A celebrated physician was afflicted with a dry cough, which continued very violent for sixty hours: having tried several remedies without success, he perceived the seat of the disorder was in the upper part of the aspera arteria, where he felt a troublesome pricking sensation, which made him think, that some small vessels being dilated poured forth an acrid humour upon this part: he concluded from hence, that cold air might be serviceable, by contracting the mouths of these vessels: he therefore exposed himself to the cold air in January, at first cautiously; but as he immediately found himself relieved, he continued to expose himself freely to the cold, and was cured <sup>c</sup>. When the nostrils begin to run in a coryza, the fluid which drops from them is frequently so sharp, as not only to inflame the alæ of the nose and the upper lip, but also sometimes to excoriate those parts so much that the persons scarce dare to blow their nose for the pain. If any thing like this happen about the upper part of the aspera arteria, a very troublesome cough must

<sup>a</sup> Lib. vii. cap. i. p. 200.

<sup>b</sup> Floyer, *Ψυχρολασσία*, p. 243.

<sup>c</sup> Academ. Reg. Scient. 1737. Hist. p. 66.



must necessarily be the consequence.

Astringent remedies, or such as are increasfating, and at the same time soften acrimony, are here also recommended; sometimes remedies of both classes are combined. Gum Arabic, gum tragacanth, starch, the roots, leaves and flowers of the greater comfrey, are given for this intention; among the astringents we may class the root, leaves, and seeds of plantain, cinquefoil, pimpernel, tormentil, bistort, &c. Bennet composed a medicine chiefly of increasfating ingredients, but with some astringents joined with them, and macerated by throwing quick-lime on them, and then pouring water over the whole: he gave six ounces every morning, for four or five days, to persons labouring under an hæmoptoë; and says, that it scarce ever failed of success. Formerly, lime-water was accounted a doubtful and suspicious remedy; but since it has been given in a considerable quantity, and for a long continuance, to persons afflicted with the stone, gravel, &c. no danger is feared from it.

But as experience has shewn, that native balsams are so useful in recent wounds, and may even be applied with success in ulcers, physicians prescribe them also in this disease. Of these, the chief which are used internally, are pure turpentine, balsam copaiva, balsam of Peru, balsam of Mecca, and of Tolu. All these appear to diffuse their fragrance very speedily through the body, as the urine shews; which, in a few minutes after any of these balsams have been taken, exhales a pleasant smell of violets. However, as all these balsams have a warm aromatic quality, they must be given in small doses, else they will increase the heat and motion of the blood: for which reason, in that number of our author's *Materia Medica* which answers to this head, only four grains are permitted to be taken, every four hours, of the mass of pills, which is composed of native turpentine reduced into a paste, with powder of liquorice-root. But although the chemists so highly praise balsam of sulphur, which consisted of sulphur digested with expressed or distilled oils, physicians, with good reason, prefer native balsams  
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for the cure of this disease. The use of native balsams seems to be of considerable antiquity, for they are mentioned by Plautus <sup>d</sup> as a common remedy well known to all. For when the servant says to the young man, *Tua causa rupi ramices, jam dudum sputo sanguinem*; "I have broke a vein in your behalf, I spit blood already;" the youth answers, *Resinam ex melle Egyptiam vorato, saluum feceris*; "Take Egyptian resin in honey, and you will recover:" Now it is well known, that turpentine is often called resin. Various prescriptions are to be found under this head in the *Materia Medica*.

3. Our author's Institutes <sup>c</sup> explain what is meant by the six non-naturals. These are, 1. air; 2. food; 3. motion and rest; 4. the passions; 5. things retained and excreted; 6. sleep and waking: All which a skilful physician will so regulate as to be contrary to the causes of this disorder. Great heat or intense cold are equally prejudicial: hence the air should be kept in a due temperature between each extreme; and how this is to be effected was explained on another occasion, (§. 605.) Now as a feather-bed heats the body more than one that is not so soft, a matraass is better for such patients; and they should be only moderately covered with bed-clothes. Rest is absolutely necessary, lest the return of the venous blood should be accelerated by the action of the muscles, and circulated thro' the lungs with too great impetuosity, and thus endanger a relapse. Hence it is evident how much a cough is to be dreaded, which not only threatens the rupture of a vessel, but prevents the already ruptured vessel from closing again.

A cough, therefore, is to be stilled by a prudent use of anodynes. For the same reason, the patient should be warned not to talk much, or call very loud for any thing he wants; on which account a bell should always be used for calling servants in these cases. Violent passions are altogether to be avoided; or, if by misfortune they have been excited, to be prudently appeased, of which we treated, §. 104. But although it be very proper, that  
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<sup>d</sup> Mercator, Act. I. Scen. 2.

<sup>c</sup> Institut. Med. §. 745.

the patient should be cheerful, yet care should be taken not to provoke him to laughter by any ludicrous speeches. Moreover, as rest of body, which is so necessary in this case, and the use of anodynes, are apt to produce a costiveness, a soft oily clyster may be necessary in order to give the patient easy stools; for if the fæces, growing dry and hard, should require a considerable effort to expel them, this will be a strain upon the lungs, and there will be danger of a relapse. Sleep should be indulged, that in this time of tranquillity the closing of the wound may be promoted: at the same time, the body should be well covered, and perspiration kept up.

The diet should be very soft, mild, and cooling, and nothing be allowed that is either acrid, or may easily turn acrimonious. The food therefore should be of the softer farinaceous substances, of soft ripened fruits, well fermented bread, milk, soft vegetables, and weak broths well cleared of their fat, with rice boiled in them; and the taste of which will be agreeable, with little or no salt; for broths made with barley, oats, &c. unless they be well seasoned with salt, are too insipid. Some people are fond of giving the patient calves-foot jelly, &c. It is well known, that the feet, &c. of animals, boiled for a long time, yield a viscid kind of glue, which is used in some mechanic arts; for the tendons and the sockets of the joints abound with this viscid substance, so that water draws off a great quantity of it from them when they are boiled. But this will form a viscid tenacious chyle, which will rather oppress the weak lungs, than contribute to nourish the body; so that these jellies are with reason to be rejected in this disease, and more diluted broth to be preferred: but when the patient begins to grow better, something of white meat (fowls particularly) may be added to these, but sparingly. And such food is to be given in small quantities at a time and often, lest the lungs should be oppressed by plenty even of good chyle poured upon them all at once: for we see, even in healthy strong men, that, after a copious meal, all the vessels grow turgid; and at the same  
time;



time, when plenty of new chyle mixes with the blood, the breathing becomes somewhat more difficult than before, partly from this cause, and partly because the stomach being distended makes the descent of the diaphragm, close to which it lies, more difficult. For a sudden repletion of the vessels in this case, even with good fluids, is to be feared; and also that the passage of these fluids through the lungs should be rendered more difficult: Hence Hippocrates says, *It is of service to such persons, if you attend them in the beginning of the disease, to bleed them in the arm; and that their diet should be such as will render the body dry, and not over-filled with blood*<sup>f</sup>. Perhaps it was for the same cause, that Celsus, in treating of this disease, has said, *But in the allowance of drink we are to remember, that thirst is serviceable in this disorder*<sup>g</sup>.

However, if the drink be diluting and soft, and not given in large quantities at once, it should seem of service; as the blood by this means may be made fitter for an easy passage through the vessels, and may be freed by the urinary passages and the pores of the skin from that acrimony which is often a cause of this disorder, as has been already observed. Celsus briefly enumerates those things which are hurtful or serviceable in this disorder, in the following words: *Besides these, rest, tranquillity, and silence, are necessary, &c. but wine, bathing, venery, oil with the meat, all acrid things, also warm fomentations, a hot close room, many clothes thrown on the body, and frictions (unless when the bleedings have ceased), are prejudicial*<sup>h</sup>.

For common drink, new milk diluted with equal parts of water or barley-water will be proper in the winter; in the summer, as more diluting liquids are then

<sup>f</sup> His consert, si circa exordia curandos susceperis, ut et manuum venæ sanguinem emittant, et victus ratione utatur, ex quo et siccissimus et maxime exsanguis evadat. *De Morb. lib. i. cap. 6. Charter. Tom VII. p. 538.*

<sup>g</sup> Sed sic bibendum est, ut sciamus huic morbo sitim prodesse. *Lib. iv. cap. 4 p. 203.*

<sup>h</sup> Præter hæc necessaria sunt quies, securitas, silentium, &c. at inimica sunt vinum, balneum, Venus, in cibo oleum, acriora omnia, item calida fomenta, conclave calidum et inclusum, multa vestimenta corpori injecta, etiam fricationes, nisi ubi bene sanguis conquievit. *Ibid.*

then necessary, the drink may be the same, only in different proportions, *viz.* two thirds water or barley-water, to one third of milk. But lest this drink should turn sour, or curdle in the stomach, a little sugar, or Venice soap, together with some absorbents, may be added. A formula for this intention is given in our author's *Materia Medica*. Hippocrates recommends the use of milk to consumptive persons, and those who are greatly emaciated; but he adds this caution, *non valde admodum febricitantibus*, "but not if they be very feverish<sup>i</sup>." A slow fever, as we shall see hereafter, often accompanies this disorder; but milk is not therefore to be forbidden: but when the fever is very intense, then a more diluted liquor is necessary, which may be made by adding water, or decoction of barley or oats, to milk, or even whey itself may be drank. How much Trallian approved of milk, or of a diet consisting only of milk and various preparations of corn, appears from the following: "Let all such persons use milk, and soft new cheese of goat or cows milk; for there is no remedy, or food, or any thing else, so suitable to them as milk: and they who began the use of it early in the disorder, and continued it constantly for a long time (taking no other food) all recovered<sup>k</sup>." He advises a milk diet to be long continued, and relates an instance of a patient who spit pus, and was in imminent danger of a consumption; but was cured by abstaining a whole year from wine, and keeping constantly to a milk diet. The experience of all physicians confirms the great usefulness of a milk diet, so that it would be superfluous to use many arguments to prove what is so well known to all.

4. The causes both predisposing and procatarctic were enumerated at §. 1198, to which we must always attend in the cure of this disease; as it is not only requisite to cure the hæmoptoë, but also to prevent its return, which frequently happens. The procatarctic causes may be prevented by a careful regimen, but the

<sup>i</sup> Aphor. Sect. v. n<sup>o</sup> 64. Charter. Tom. IX. p. 237.

<sup>k</sup> Lib. vii. cap. i. p. 304.

predisposing are more difficult to correct. Thus an hereditary disposition to an hæmoptoë cannot be removed by art, and it is difficult to correct those causes enumerated at n<sup>o</sup> 1, 2. of said aphorism. Nor can this ever be effected speedily; but if done at all, it must be by slow degrees. As to the weakness of the vessels, that indeed age will alter for the better, as the solids gradually acquire more firmness; and it is well known of how great service exercise then is, concerning which we refer to §. 28. An acrid disposition of the blood may be corrected by soft aliments, and remedies of an opposite nature to the predominant acrimony: or the acrid humours may be driven by art to other parts of the body, and thence discharged; of which we shall speak presently. But who can hope to alter the flatness and straitness of the chest, depressed shoulders, and a long neck, which are enumerated (§. 1198.) among the prognostics of an hæmoptoë and phthisis? However, some service has been done by prudent management even in these cases, as Bennet attests, whose authority is deservedly of great weight in every thing relating to this disease. His words are: “ They who from the use of  
 “ remedies, or by travelling, have their chest, which  
 “ was too strait, enlarged, their body grown, their  
 “ strength increased, and their complexion more  
 “ blooming, have a gleam of hope of recovery, the  
 “ vital warmth spreading its glow all over the bo-  
 “ dy<sup>1</sup>. And Atticus, as was said §. 1198, by travelling into Asia, had his constitution greatly altered for the better in these respects.

Concerning that acrimony of the fluids which arises from diseases, we have treated in part already, and more will be said on this subject when we give the history of the Small-pox.

It was before noted, §. 1198, that acrid humours flowing along with the blood have sometimes found a passage out of the body by various outlets, not only greatly to the relief of the patient, but frequently to his entire recovery. These new discharge sometimes arise spontaneously, sometimes art successfully imitates these

<sup>1</sup>Tabid. Theatr. p. 112.



these efforts of nature. The ancient physicians seem more frequently to have attempted this than the moderns. Hippocrates says, *That after a spitting of blood, although no pus followed, and though the patient seem very well, there should be cauteries made in the breast and back by turns: and when the sores from the cautery are cured, the patient should abstain from intoxication for a year, and should not overload himself with food, nor work hard, nor ride in a carriage, but endeavour to make his body plump<sup>m</sup>.* He commends this practice of cauterizing the breast and the back in other places after the body has been rendered plump and fleshy and by drinking plentifully of milk diluted with water and mixed with honey: *For (says he) if the cautery succeeds well, there is hope the patient will not relapse<sup>n</sup>.* Trallian relates, that he advised a man who was subject to a defluxion on the chest, and to a cough, to be burnt on the head with a red hot iron; and the patient readily complying with this advice, he says, “ it was “ wonderful to observe how the defluxion of the hu- “ mour and the cough ceased, and the patient re- “ mained free from defluxions ever afterwards o.” At this day we use more gentle methods in our practice; but whether better, may be doubted.

As the suppression of customary discharges is enumerated among the causes of an hæmoptoë, it is sufficiently evident that these must be again promoted, as was said before.

§. 1201. **W**HEN a spitting of blood has been cured, bleeding should be used every six months for some years, gradually lessening the quantity each time.

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Al-

<sup>m</sup> Quumque ipse optimo corpore sese habere videbitur pectus et dorsum vicissim utrumque inurito. Ulceribus curatis, per annum ebrietate abstineat, non impleatur supra modum, neque manibus vehementer laboret, neque vehiculum conscendat, sed quam maxime crassum corpus ipse reddat. *De Morb. lib. ii. cap. 21. Charter. Tom. VII. p. 572.*

<sup>n</sup> Si enim ustio bene successerit, morbum effugiendi spes est. *De Inter. Affect. cap. 1, et 3. ibid. p. 640, 641.*

<sup>o</sup> Lib. vii. cap. 1. p. 303.

Although an hæmoptœ has been happily cured, so that no symptom of the disorder remains, but all the signs of a perfect cure appear, as, “ a free breathing, no cough, and recovered strength,” which Bennet<sup>a</sup> establishes to be “ signs of safety, and the “ contrary of danger ;” yet we ought not to be too secure, as this disorder has often been known to return, unless diligent caution be used. We have already taken notice, and shall see further at §. 1207. that an hæmoptœ occasioned by external violence, without any internal predisposing cause, is the least dangerous of any : yet Hippocrates warns us that a relapse is to be feared even in this kind of the disorder. *Often when a vein has been broken by wounds, or violent efforts of labour, or too strong exercise, or any other cause, when it is closed again, and seems cured, it will break open again at another time ; or it may be again broken by the same causes which first injured it ; and when it is thus broken it throws out blood, and the patients die of a sudden and copious effusion of blood, or they spit out fresh blood from time to time, and, throwing up much thick pus all day, die in the same or in a like manner,*<sup>b</sup> &c. In another place<sup>c</sup> he makes the same observation ; and adds several cautions: such as, That they should not run swiftly against the wind ; should not ride either on horseback, or in a chariot ; should avoid shouting and passion ; should abstain from acrid, salt, and fat things. At the same time he warns, that a relapse is worse than the first attack of the disease. The scar of the broken vessel is often weak, so as that even from a small increase of the quantity of the blood, or in its rarefaction, or the velocity of its motion, a  
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<sup>a</sup> Tabid. Theatr. p. 112.

<sup>b</sup> Sæpe quibus vena aliqua a vulneribus, aut quibusdam laboribus, aut exercitationibus, aut alia quadam causa, intus fauciatur, quum coaluerit, et sana esse vena videbitur, iterum alio tempore rumpitur ; iterumque rumpitur ex iisdem causis a quibus prius affecta erat. Quum vero iterum rupta est, sanguinem effundit, confestimque copiosum sanguinem, et crebro vomentes intereunt, aut subinde recentem sanguinem vomunt. Multum autem et crassum pus per totum diem spuantes, eodem aut consimile modo pereunt. *De Morbis, lib. i. cap. 9. Charter. Tom. VII. p. 543.*

<sup>c</sup> De Intern. Affect. cap. 1, 2, 3. Ibid. p. 678, 641.

second rupture of the vessel may be feared ; and thus the spitting of blood may become habitual, although an ulcer of the lungs and phthisis may not immediately follow upon it. Tulpius<sup>d</sup> relates a case of a painter who spit blood for upwards of thirty years ; who took, nevertheless, many journeys ; till at last, says he, “ this restless man enlarged the hiatus of the vein “ so much, that nothing could save him.” In another instance, a spitting of blood lasted twenty years before it turned to a consumption : but this was then so violent as to destroy the lungs entirely ; and accompanied with such a stench, that the physician would not venture to open the body after his death. I have also not seldom seen such spittings of blood as have lasted a long time ; but in all these cases, after a miserable life, either a sudden death from a violent discharge of blood has followed, or an incurable consumption. A very worthy French ecclesiastic, who had laboured under an hæmoptoë eleven years, had so great a weakness in his lungs, that if he attempted to read, even without moving his lips, he felt a pain in the breast ; and unless he left off immediately, a spitting of blood came on. Nay, the cicatrix of the broken vein often growing rough, produces an almost continual teasing cough ; and sometimes the vessels near to such a rough cicatrix, which is not yet quite firm, being distended by an increased quantity or impetuosity of the blood, press upon the scar, and produce a like inclination to coughing, which endangers a new rupture of the vessel. There is a remarkable passage in Hippocrates which confirms this opinion : For after he had spoke of an hæmoptoë occasioned by a vein being broken from hard labour, he adds, *But even if the vein be not quite broken, but only strained, and there be a varicous swelling upon it ; when this happens, it occasions a slight pain, and a dry cough ; but if it has lasted long and been neglected, there follows first a discharge of a small quantity of blackish blood, afterwards more and purer blood is effused, and at last pus also,*<sup>e</sup> &c.” And he

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<sup>d</sup> Lib. ii. cap. 2.<sup>e</sup> At si vena quidem non omnino rupta fuerit, sed tantum tractus in ip-



orders, that the patient should by bleeding and diet be rendered in a manner bloodless, to the end that the distended vessels may subside. *If they are taken care of at the beginning of the disease, the veins subside and become low* <sup>f</sup>.

From all these observations, the usefulness of bleeding to prevent the return of an hæmoptœ is sufficiently evident. Hence, by way of prevention, blood should be taken twice a-year from those who seem quite recovered of this complaint; and that about spring and autumn chiefly, at which seasons the greatest changes are used to happen in the body. I generally order more frequent bleedings for the first two or three years, especially if the patient be young, and of a sanguine constitution. Besides this, I carefully observe whether any of those symptoms attend which appeared before the coming on of the hæmoptœ. These symptoms are very different. Thus Bennet has observed, “ If, after spitting of blood, there follows a “ spitting of a ropy, bluish, smooth matter, and this “ continues for some time, it denotes a return of the “ hæmoptœ; if this matter be purulent, it foretels “ a phthisis, both to young and old. If no matter at “ all be spit up, it prognosticates a recovery <sup>g</sup>.” It has happened that I have observed many other symptoms of a relapse in an hæmoptœ; which, whenever I perceive, I have always immediate recourse to bleeding. Some persons feel a kind of oppression upon the breast: some find an increased heat in the thorax, with a slight dry cough: some have a strange unusual pulsation in the right, and some in the left flank; and seem to feel, as they say, the blood moving upwards from the flanks to the chest; and when this has happened several times, the spitting of blood returns, unless prevented by bleeding. Hence it appears, that there

sa fiat: fit autem præcipue velut varix, quod etiam confestim ubi factum fuerit, dolorem quemdam tenuem, et tussim siccam exhibet. Si vero diutius morata et neglecta fuerit, primum quidem paucum et subatrum sanguinem dimittit, mox etiam copiosorem et maxime sincerum, deinde etiam pus. *De Morb. lib. i. cap. 6. Charter. Tom. VII. p. 537, 538.*

<sup>f</sup> Quod si incipiente morbo curentur, rursus venulæ in loco ad latus subsident, et humiles fiunt. *Ibid.*

<sup>g</sup> Tabid. Theatr. p. 109.

there can be no general rule by which to determine how often in a year the bleeding should be repeated, but this must be left to the judgment of the physician. However, less is to be feared from too frequent than from too seldom bleeding: For if the hæmoptoë return, large and copious bleedings may be necessary to stop it; whereas one moderate bleeding would have prevented it. It was observed before at §. 106. that frequent bleedings dispose the body to a renewed plethora, and at the same time weaken the body; but this is a less evil than the danger of sudden death from a violent hæmoptoë, or of a consumption following it. Hence the bleedings are by degrees diminished in frequency and quantity, after no relapse has happened for three or four years: for then we may have good hope that the cicatrix of the broken vessel is firm; which, as the strength of the solids increases by age, will not afterwards be easily opened again. But it would be dangerous to leave off bleeding all at once, as was said before at §. 106.

But unless the patient be complying, all the physician's care will be vain; and unless he will submit to a temperate regimen, and abstain from violent exercises, especially such as strain the lungs so much as to bring on the hæmoptoë on a healthy body, which were enumerated at §. 1198. Their situation is very unhappy, who cannot, or will not, abstain from such labours; and I have often lamented, that many whom I had hopes of recovering, died because they were obliged to gain their livelihood by playing on wind instruments and by singing, or were greatly delighted with such occupations. Moliere acting for the fourth time the part of the *Malade Imaginaire*, though he felt himself disordered more than usual with an old complaint in his breast, continued playing his part; and scarce was he come off the stage when a violent vomiting of blood seized him, and he died. How greatly do pleaders strain their lungs, *qui cuivis ira et verba locant*! This the satyrist has well described.

*Ipsi magna sinant, sed tunc cum creditor audit  
Præcipue, vel si tetigit latus acrior illo;*



*Qui venit ad dubium magno cum codice nomen,  
Tunc immensa cavi spirant mendācia folles,  
Conspuiturque sinus, &c.*

Juv. Sat. vii. ver. 108.

- “ Talks loud enough in conscience for his fee,  
“ Takes care his client all his zeal may see;  
“ Twitch’d by the sleeve, he mouths it more and more,  
“ ’Till with white froth his gown is slabber’d o’er.  
“ Ask what he gains by all this lying prate?  
“ A captain’s plunder trebles his estate.”

DRYDEN.

Although not the liver, (according to his expression, *Rumpe miser tensum jecur*, “ and burst thy o’erstrained liver, wretched man”), but some vessel in the lungs, must have been burst in these speakers, and sometimes have occasioned their death.

§. 1202. **B**UT if the hæmoptoë be very profuse, if styptics have been improperly applied, or the method of cure directed in §. 1200. neglected, there arises, after the spitting of blood, a difficulty of breathing continually increasing; a shivering in different parts of the body; a heat and redness of the cheeks; a dry cough; a hectic fever; great thirst; weakness; and a sense of weight in the thorax: these symptoms denote, that the wounded vessel has changed the matter collected about its lips, and under the crust of dried blood, into pus; and that this collection is turning into a vomica, which, upon breaking, terminates in an open ulcer of the lungs.

The great hope of cure in this disease, is, as has been said, that the injured vessel in the lungs may be cured like a fresh wound, without suppuration, which has always justly been accounted dangerous. When the hæmoptoë arises from an anastomosis of the vessels, there are great hopes of a cure, because by the loss



loss of blood brought up, as well as by bleeding, the emptied vessels will contract of their own accord. If from any violent cause a vessel be ruptured in the lungs, there yet may be hopes of closing the wound without suppuration, unless it be very large indeed. But when the vessels have been corroded by the acrimony of the fluids, it will then certainly be difficult to prevent a suppuration; for this is not a simple wound; and the inflammation which commonly arises about the lips of the wound, (see §. 185, n<sup>o</sup> 5.) will not go off by a mild resolution, because to effect this a mild disposition of the fluids is absolutely requisite. See §. 386. Nor is it always in the power of art to correct, in a few days, such an acrimony in the fluids, as was great enough to corrode the vessels themselves.

Grumous blood left in the lungs after an hæmoptœ, is another cause of suppuration: for when the hæmoptœ ceases, some part of the concreted blood remains about the orifice of the ruptured vessel, and even in the bronchia themselves; and as such patients must be kept quiet, and breathe as gently as possible, grumous blood will sometimes remain there a considerable time. But when strong styptics have been applied, or the hæmoptœ stopt by drinking very cold water, there is reason to fear, that grumous blood has been formed, and adheres to these parts. But before, at §. 172. we took notice, that Hippocrates had said “If the blood is preternaturally effused into the belly, pus will necessarily be formed.” But Galen, in his commentaries on this aphorism, has well observed, that Hippocrates does not there speak of the effusion of blood into the *belly*, properly so called, but into any other cavity: at the same time he adds, that by suppuration here is understood every kind of *corruption* of the blood, and not only a conversion of it into *pus*, properly so called. But the blood in a warm moist place, if at the same time the air have access to it, soon grows putrid; and thus may, from its acrimony, corrode the neighbouring vessels, and thus augment all the complaints, and bring on a suppuration. The ancient physicians certainly seem to have feared this bad con-

consequence from grumous blood left after an hæmoptoë, and therefore they were solicitous that it should be evacuated as soon as possible. Galen, in the cure of a violent hæmoptoë, after ordering the patient to breathe gently, and to be silent; and after he had ordered bleeding, &c. says, *When these things have been done, a thin warm posset is to be drank, by which, if any clot of blood remains in the lungs, it may be dissolved and coughed out, (ἐκἐγχθῆναι); and there is no reason why this should not be repeated every three hours, for two or three times*<sup>a</sup>. Trallian<sup>b</sup> speaks in the like manner; thinking, that not only the grumous blood is dissolved by this means; but that also a further effusion of blood may be hindered by vinegar, to which the old physicians ascribed an astringent quality. Certainly, Bennet also seems to have feared a phthisis may be produced from grumous blood long retained in the lungs: for he says, “ That if, after the hæmoptoë ceases, the  
 “ remaining blood, on account of the lungs not be-  
 “ ing of very acute sensibility, or the pectoral muscles  
 “ not exerting themselves, has not been thoroughly  
 “ cleared away, there is danger that a phthisis should  
 “ follow from a putrefaction of the grumous blood,  
 “ or of the lungs themselves<sup>c</sup>.” It cannot be denied, that we should be solicitous for the removal of this grumous blood; but at the same time all possible caution must be used, lest, by exciting a violent cough, the hæmoptoë, which had been stopped, should return, which is always dangerous. Before, at §. 357. when we treated of accelerating the breaking of the vomica of the lungs, it was said, that the steams of vinegar or of hot wine raised a cough, by which the lungs being agitated, the abscess often bursts on this account. I own, I never ventured to advise persons troubled with an hæmoptoë to take a posset, and I have oftener advised it three hours after the hæmoptoe was stopped. It is true indeed, that the old physicians did not give oxy-  
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<sup>a</sup> Ubi hæc sunt facta, primum posca tum diluta tum tepida potui est offerenda; quo si quis in viscere thrombus latitet resolutus extussatur (ἐκἐγχθῆναι), atque hoc nihil vetat bis terve ternis horis facere. *Method. Med. lib. v. cap. 8. Charter. Tom. X. p. 115.*

<sup>b</sup> Lib. vii. cap. 1. p. 389.

<sup>c</sup> Tabid. Theatr. p. 108.



erate or posset hot, only luke-warm; which irritates vessels indeed, but still it irritates: nor can this grumous blood be presently thrown out but by a cough, which will always be safer afterwards, when the broken vessel has already contracted itself spontaneously, and there is already a beginning of a consolidation. Besides, it is to be observed, that a clot of grumous blood stopping in some branch of the aspera arteria, is often continuous with the grumous particle which stops up the wounded vessel; and therefore, if such a clot of blood be brought away, the other must also come away with it, which stopped up the wounded vessel, and the hæmoptoë will come on again, to the danger of the patient; which, even if we should again succeed in stopping it, may leave grumous blood again to be removed. I have sometimes seen, these grumous clots spontaneously discharged by a slight cough in a day or two: for, in a warm moist place, the grumous blood gradually begins, as it were, to liquify; and the adhesion of the clots of blood to the sides of the bronchia is diminished, or quite removed, and thus they are easily spit out. But if after two days no grumous blood come away, and the patient feels a weight and oppression in the breast, I advise him to draw in with his breath the steam of warm water, which generally brings these clots away with great ease: nor have I observed any harm to follow from this delay. But although Bennet fears a phthisis from the retention of grumous blood, yet he says soon after, “the bronchia are less obstructed by grumous blood growing putrid, than by the nutritious juice when it is concocted into a mucilaginous substance, <sup>d</sup> &c.” We mentioned this passage on another occasion, §. 1198. It is certain, that when the extravasated blood begins to grow putrid, it liquifies, and by that means is more easily spit out.

Besides, from what has been mentioned §. 1199. it appears, that grumous blood collected in the air-vessels of the lungs does not always grow putrid, but is sometimes formed into polypous concretions, which, when



when thrown out by coughing, retain the form of the vessels and their ramifications: And indeed, it seems probable enough, that blood concreting in the bronchia seldom grows putrid there, as it is generally thrown out from thence before; or if it remain there long, it will be more likely to turn to a polypous substance. And it was also observed at §. 1199. that a cellular membrane runs every where between the bronchia, through which membrane innumerable vessels are distributed; if these should be ruptured, they would pour forth their blood into the cells of this membrane, which coagulating, and adhering to the outside of the air-vessels, might by its long stay corrode and inflame the lungs, especially if the humours be acrimonious. But if the larger vessels should be corroded by such a cause, so as to bring on a violent hæmoptœ, the same evil might be feared from a cough, excited with the intention of throwing off these grumous concretions; and such a putrescence of the grumous blood, as that of which we have just been speaking, is prior to a copious hæmoptœ, not consequent upon it. From all these things, it appears to me a dangerous experiment to attempt the expulsion of the grumous blood from the lungs, by methods which excite a cough, presently after the hæmoptœ is stopped.

The signs of an abscess being formed in the lungs after an hæmoptœ, were treated of at §. 834, 835. when we discoursed concerning the vomica of the lungs following a peripneumony; for all the symptoms are the same here. For suppuration does not follow a spitting of blood, unless an inflammation come on upon the wounded part of the vessel so violent as not to admit of resolution; and hence, as has been said before, physicians have always been very anxious to prevent an inflammation. It is true indeed, that generally a larger vomica follows a peripneumony, than after an hæmoptœ: but this tendency to suppuration once begun, gradually extends and preys on this viscus, unless the ulcer can be soon cleansed, and the wound consolidated. But as this evil is slight in its beginning, the physician should be very careful not to be deceived

deceived in this prognostic; and not to let the patient, from too great security, neglect a proper regimen. Wherefore we should carefully attend to the symptoms here enumerated. This Fernelius judiciously remarks, when he treats of the vomica of the lungs: "This is a very obscure and concealed disorder, and often not apparent either to the patient or the physician; so that the patient neither alters his course of living, nor thinks himself ill, but bears about unknowingly in his breast the seeds of death." He remarks also, that some have died unexpectedly by the sudden breaking of such a vomica; and this happened in particular to two famous physicians, who, notwithstanding their skill, found no symptoms beforehand of their approaching fate; "neither fever, or loss of appetite, or any other complaint, forewarned them of it." However, they do not seem to have been deceived, because there were no signs of the hidden evil, but because they did not attend to them, as Fernelius owns: for he says, "All persons in this disorder, some days before the vomica breaks, have a spitting of blood with a cough; and the breath is offensive and fetid; there is a heaviness of the body, a slight oppression of the breast, and a difficulty of breathing." Certainly, the spitting of blood might have made these physicians aware, that there was reason to apprehend a vomica; and the symptoms just mentioned shewed sufficiently that it was actually formed. Such mistakes are not to be charged on art; but on the artists, not sufficiently attentive to what passes in the disorder. Perhaps that physician might sooner be excused for his mistake, who, seeing a patient spit up blood with a cough, thought that after his death (which happened soon after) he should find an abscess in the lungs; whereas, on dissecting the body, the lungs were found quite sound, but the maxillary, frontal, and sphenoidal sinuses were quite full of pus. It appears, indeed, from the history of the disease, that this patient had a violent head-ach,

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with a fever, and the disorder killed him soon; which symptoms do not agree with a vomica of the lungs: and it is very likely that pus was discharged from the nose of this patient, as all these sinuses have issues into the cavity of the nostrils, but that part of the pus which fell through the posterior foramina of the nostrils into the fauces was discharged with the cough.

Hence we conceive why Hippocrates said, *In them who feel shiverings in health, a suppuration is about to succeed a hæmoptoe*<sup>h</sup>: he says, in health; not that such men can be strictly called healthy, but because they seem such to themselves, and to other unskilful persons. He adds, in the next aphorism, *a shivering and difficulty of breathing, with pains, are signs of a phthisis*<sup>i</sup>;

When the physician attends to all these symptoms appearing after an hæmoptoë, he will not easily be deceived. But we are to note, that they do not all appear at first, but succeed each other. Generally a sensation of oppression in the breast, and an obtuse pain, with vague shiverings, are the first in order; then the other symptoms follow, in the order in which they are here ranged. But all these symptoms are slighter, or more grievous, as the disease makes a slower or a quicker progress; as the vomica in the lungs is larger or smaller, and the humours being mild or acrid, will likewise occasion a difference herein. However, a phthisis arising from an hæmoptoë generally preys slowly on the body, as will be observed hereafter; and therefore is justly to be reckoned among chronic diseases.

§. 1203. **T**HIS collection of matter likewise arises not only from the causes enumerated at §. 1198. but also from any peripneumony terminating in an abscess: which is known from the symptoms enumerated at §. 832, to 843, and 867.

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<sup>h</sup> Quibus sanis horrores crebri sunt, ii ex sanguinis profluvio purulenti sunt. *Coac. Prænot.* n° 16. *Charter. Tom. VIII.* p. 854.

<sup>i</sup> Horror et spirandi difficultas cum doloribus tabis signa sunt. N° 18. *Ibid.*



Hitherto we have explained how and from what causes an hæmoptoë, and after an hæmoptoë an ulcer in the lungs, arises; by which the whole habit of body wastes away, and then a phthisis pulmonalis is said to take place (§. 1196.) But a vomica of the lungs arises also, sometimes, from an inflammation of this viscus so violent as not to admit of resolution, even without an hæmoptoë having preceded; as was explained before, under the numbers cited in the text: where also are enumerated, those symptoms which shew that an inflammation of the lungs tends to suppuration; as also those appearances which shew that pus is already formed, and that it is inclosed in a bag, which disorder is then called a *vomica*: which pus, unless it can soon be expectorated by spitting, or be thrown by metastasis upon other parts of the body, and thus the lungs be freed from this load of purulent matter, a phthisis pulmonalis follows; and the former disease loses its name, as Aretæus<sup>a</sup> has well observed. For after he had said that the disease is called a *phthisis*, when there is a spitting of pus after a long cough or an hæmoptoë, he adds, “ But if there be a  
“ suppuration in the breast or side, and the pus be  
“ drawn through the lungs, such patients are said to  
“ have an abscess; but if the lungs themselves be ul-  
“ cerated, by being corroded from the pus passing by  
“ them, this is no longer called *εμπύη*, a *suppuration*,  
“ but *φθον*, *corruption*, or *phthisis*: and then he proceeds to describe the symptoms of a phthisis pulmonalis. His distinction is very just with regard to the passage of the pus, formed after a pleurisy, thro’ the lungs, of which mention was made in the account of the Pleurisy; and this passage often happens without any great injury to the lungs; but when this pus is not soon discharged by a copious spitting, it begins to accumulate in the lungs, and, becoming acrid, by corroding this viscus it produces there an ulcer and subsequent phthisis.

§. 1204. **A**N empyema (§. 1185.) likewise  
I 2 may

<sup>a</sup> De Causis et Signis Morbor. Diuturn. lib. i. cap. 8. p. 86.

may corrode, dissolve, and consume the lungs; so that the same disease follows, as from an ulcer originally formed in their substance. This is known from the symptoms enumerated at §. 1188, No 4.

A collection of pus between the lungs and the pleura, in the cavity of the thorax, is called an *empyema*; but it appears from what has been said before, under the numbers quoted here in the text, that in this case the lungs will be corroded and consumed by the pus collected so near to them, unless an outlet can be procured to discharge the empyema before the lungs are much injured.

But before, when we treated of the Peripneumony, we shewed, that the pus collected in the lungs was sometimes derived to other parts by metastasis, and the viscus by that means freed from the danger of suppuration; but it has also happened, that the pus first formed in other parts of the body, has been re-absorbed into the blood, and falling suddenly on the lungs has produced a vomica, from whence all the above enumerated evils are to be feared; concerning which, see what has been observed at §. 406. of the re-absorption of pus remaining too long in a close vomica.

Every disease, therefore, which is capable of producing an ulcer in the lungs, may terminate also in a phthisis.

§. 1205. **W**HENCE it is plain, what these signs are which denote an ulcer in the lungs, even though it be latent; what the various causes; how many different kinds of ulcers, and likewise how many different kinds of consumptions there are.

When pus is spit after an hæmoptoë, no one doubts that the lungs are ulcerated; especially if fresh matter be brought up every day, and the quantity not lessened in a few days: For if, after the rupture of some large

large vessel, a violent hæmoptoë has ensued, it sometimes happens that the breach of the vessel cannot be closed unless after a slight suppuration; as we see is the case in external wounds, in which the lips of the wound close under laudable pus, and the loss of substance is repaired. The same thing sometimes happens after an hæmoptoë: but then the pus spit out is in small quantities only, and the spitting lasts but for a few days; the quantity spit out soon grows less and less; and at last the spitting entirely ceases, after the wound is closed: but if this suppuration lasts a long time, and the quantity of pus spit out increases every day, this is a sign not of a slight suppuration, which helps the healing of the wound, but rather denotes an ulcer of the lungs extending itself more and more.

It is more difficult to distinguish a latent vomica formed after an hæmoptoë; as the disorder usually begins with very slight symptoms; yet the physician who attends to the signs laid down in §. 1202, will not be easily deceived in his diagnosis.

But the physician may be easily deceived, when, without any spitting of blood, or any other considerable complaint, a vomica is formed in the lungs, and gradually grows larger, till, bursting of itself, it occasions sudden death.

Tulpius has observed, that this disorder was very common among the Dutch, either from a bad diet, or from the damp and foggy air. At the same time he tells us, that it is sometimes so concealed, “ as scarce  
“ to give any tokens of its existence, except a cough,  
“ dry at first, but soon after accompanied with spit-  
“ ting; some time after, there comes on a difficulty  
“ of breathing, and faintings, and the body gradual-  
“ ly withers and decays, although in the mean while  
“ the spittle has neither pus nor blood in it <sup>a</sup>.” But the vomica being burst, either the patients are suddenly suffocated, the great quantity of pus instantaneously filling up the bronchia; or if they escape this immediate destruction, they die soon after, all their strength totally failing in a sudden fainting fit: yet in



such a case, the dry cough, the asthma, the decay of the body, would easily shew a skilful physician that there was a concealed disorder in the lungs.

A like disorder seems to have been much more difficult to discover in a magistrate, who, having a continual fever, on the bursting of a vomica in the thorax, “ he died in two days afterwards, overcome both by  
“ the pain preceding the eruption, and by the load of  
“ pus discharged from it afterwards:” and although the patient easily comprehended that this unexpected discharge of matter had been collecting for a long time, yet he solemnly averred<sup>b</sup>, that he had not perceived any signs of this concealed vomica, not even a cough, or any other inconvenience, from this lodgment of matter in his breast. However, it seems probable, that this patient feeling no disorder, had consulted no physician; who, perhaps, would have discerned some symptom of this hidden evil. At the same time this may shew us, how diligent an attention is necessary to observe the diagnostics of such diseases; for although no remedy could have saved the patient in this case, yet the reputation of the physician will always be in danger if he be thought ignorant of any concealed disease. It is, however, to be owned, that in such a case, if ever, the error of the physician would be excusable, if, when called to a patient with whom he was quite unacquainted, and finding him in a continual fever, he should mistake the pain in the breast for an original complaint, whereas it arose from the near approach of the vomica to bursting.

It appears from what has been said, how manifold and how various are the causes of a phthisis. Several have been already enumerated, (§. 1198.); but these were principally considered as first producing an hæmoptœ, and afterwards an ulcer of the lungs and a phthisis. But there are other causes which, without a spitting of blood, often produce an incurable consumption: and the knowledge of such causes indicates a different method of cure in this disease, and at the same time is of great importance for directing the physician

ficiant to make a sure prognostic; for there is more or less hope of a cure, as the known causes are more or less difficult to remove or to correct. Bennet, well aware of this, in the very beginning of his book admonishes us, that diligent attention is necessary to distinguish the causes of this disease; altho' he owns it very difficult to distinguish them, saying, "But it is not every man that can make this distinction; for which purpose, we must carefully watch the steps of nature, and diligently perpend, whether an acrimonious humour preying on the principles of life, an immoderate heat melting down the humours, or a less violent heat drying up the the extremities of the body, consumes the frame<sup>c</sup>." From the same sources he forms various prognostics. He has indeed many excellent observations; but this passage may serve for a specimen: "An effusion of blood caused by a plethora and an over tension of the vessels, is more easily cured than that which takes its rise from the depravation of the fluids and the erosion of the vessels<sup>d</sup>."

Various causes of a phthisis are enumerated by both ancient and modern physicians; and, among them, some which one should not readily imagine. It was noted before, (§. 1198.) that Hippocrates had said, that the lungs were sometimes obstructed by phlegm, and a phthisis followed thence; but in another place, where he mentions three kinds of phthisis, he says, *The first is caused by a pituita, when, the head being obstructed with phlegm, a fever comes on, and the pituita in the head, which cannot be dislodged, grows putrid: then, when it grows thicker and purulent, and the veins are inordinately filled, a defluxion upon the lungs comes on; by which, when the lungs are affected, they become diseased, being irritated by a salt putrid phlegm<sup>e</sup>.*

Nay, Galen seems to have given this cause of a phthisis.

<sup>c</sup> Tabid. Theatr. p. 3.

<sup>d</sup> Ibid. p. 107.

<sup>e</sup> Prima quidem a pituita oritur, cum caput pituita plenum aggraritur, et calor accesserit, in capite pituita computrescit, ut quæ moveri nequeat ut secedat. Deinde quum crassior evaserit et computruerit, et venulæ supra modum impletæ fuerint, fluxio in pulmonem contingit, quam ubi pulmo susceperit, statim morbo afficitur, cum a pituita salia et putrida mordeatur. *De Internis Affect. cap. ii. Charter. Tom. VII. p. 645.*



sis a still greater extent, when he says, *For there are two great differences: One consists of defluxions from the head; but the other (which takes its rise from disorders of the lungs themselves) from spitting of blood, and above all from the bursting of a vessel, and often from a defluxion of humours on this viscus from other parts than from the head*<sup>f</sup>. On another occasion (§. 719.) when we mentioned mucus as the material cause of a diarrhœa, it was observed, that the ancients, when they saw a sudden collection of humours in any place, thought that this collection was accumulated in the brain (which they imagined to have scarce any blood, and to be cold), and from thence derived to other parts: Hence, they were always fearful of defluxions from the head. And Galen seems to have known from his own experience, that such a defluxion might be derived also from other parts upon the lungs: and even a catarrh falling on the membrane which invests the air-vessels of the lungs, may, by a perpetual and long secretion of such mucous matter, occasion the vessels to be so dilated, that the useful humours may be let out together with the mucus, and the whole body be, as it were, dried up, and the patients die exhausted by a true marasmus, as we noted before §. 793. To this is to be added, that a long troublesome cough, which constantly attends this disease, may do great injury to the lungs; for which reason Cœlius Aurelianus, treating of the phthisis, says, “ If, after a spitting of blood, and sometimes also after a cough of long standing, or a catarrh, by which the upper parts of the thorax are injured, at first slightly, but in progress of time become exulcerated, a collection of pus be made within, and this not being cleansed away, the disorder is sooner produced<sup>g</sup>.” Bennet also admonishes us, that the secret cause of a phthisis is

<sup>f</sup> Duæ namque sunt ejus differentiarum maximæ: una quidem ex capitis defluxionibus constat; altera vero, quæ ex ipsius pulmonis affectibus ortam ducit, prorsus quidem ex cruentis sputis, maximeque rupto vase, sæpius vero et rheumate affecto viscere, ob aliam quandam ex aliis partibus, non ex capite causam. *Comment in lib. i. Epidem. Charter. Tom. IX. p. 23.*

<sup>g</sup> De Morbis Chronic. lib. ii. cap. 14. p. 410



often in a catarrh; and he adds, “The saline part of the blood, nay, even the insipid humour commonly called *pituuta*, secreted from the vessels, lodging for some time in a particular part, not only dissolves the cohesion and fabric of the part where it lodges, but, acquiring itself a putrid disposition by its stay, it becomes the ready cause of an erosion of the vessels <sup>h</sup>.” He has the like observations elsewhere <sup>i</sup>; where also he enumerates the symptoms of this phthysical disposition, which partly shew the existence of a defluxion, and partly that the lungs themselves are affected by it. But a phthisis is chiefly to be feared in consequence of an inveterate catarrh, when the body is predisposed to this disease, concerning which see the observations on §. 1198. This Celsus seems to insinuate, when he says, “Frequent catarrhs in a tall and slender body, shews that there is reason to fear a consumption <sup>k</sup>.” And although such obstinate catarrhs should not bring on at last an ulcer of the lungs, they may however exhaust the body, as was said a little above. A physician of great note has often experienced, “That many persons, every day, for a long time, throw up in coughing, vast quantities of salt, sweet, or sometimes quite insipid mucus, which has no smell, nor any thing purulent in it, the glands of the *aspera arteria* being relaxed. This is often, though the patients bear it long, not less fatal in the end than a spitting of blood <sup>l</sup>.” And he compares the effect of such a copious and long spitting, to those disorders which are produced in consequence of a diarrhoea or a diabetes of long continuance, by which patients waste away without any matter or pus being formed in the body: and hence he concludes, that it is not all consumptions of the lungs that are caused by an ulcer; nay, that putrid consumptions are more rare than is commonly imagined. Certainly, if the vessels of the lungs should be so dilated, as to give a passage to let out those fluids which are to

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<sup>h</sup> Tabid. Theatr. p. 9.  
p. 7. p. 58.

<sup>i</sup> Ibid. p. 102, &c.

<sup>k</sup> Lib. ii.

<sup>l</sup> Huxham de Aere et Morb. Epidem. Tom. II.

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repair what is continually exhausted both in the fluids and in the solids, the body will necessarily waste away, as was noted §. 1169. But it would be more systematical, perhaps, to range a disorder of this kind under the head of an atrophy or marasmus, than under that of a phthisis pulmonalis; in which disease, according to the definition given of it §. 1196. an ulcer of the lungs is supposed.

Whatever therefore may produce an ulcer in the lungs, deserves to be reckoned among the causes of a phthisis pulmonalis. Hippocrates<sup>m</sup> has remarked, that the tubes of the lungs, or the aspera arteria, are sometimes subject to aphthæ, as was said before, §. 978. where we also informed the reader, that by aphthæ were understood small ulcers, solitary, or at most but few in number, which sometimes infest the inside of the mouth, the lips, and the fauces, &c. They have a white or yellowish spot in the middle; all round this spot is inflamed, red, and painful; sometimes they are easily cured, sometimes also they turn to very bad corrosive ulcers with great putridity. All these little ulcers have this in common, that this white or yellowish spot separates from the other parts of the ulcer to which it had cohered, and then the place is soon cleansed and consolidated. The description which Hippocrates has given of this disease, agrees admirably with what we see happen in these aphthæ, when they are exposed to the sight: *The patient has a slight fever, a pain in the middle of the breast, an itching of the body, and a hoarseness; he spits thin and liquid saliva, sometimes also thick and like ptisan; the breath smells like stinking fish; and from time to time, hard bits, like fungous flesh from an ulcer, appear in the spittle; the upper parts first, and afterwards the whole body, are extenuated, the cheeks are flushed, the nails in process of time are contracted; they grow dry, and of a pale sickly colour; and the patient soon dies, after spitting blood and pus, unless he be cured,*<sup>n</sup> &c.” For in these aphthæ, the

<sup>m</sup> De Morbis, lib. ii. cap. 18. Charter. Tom. VII. p. 570.

<sup>n</sup> Febris imbecillis detinet, et medium pectus dolor; et corporis pruritus.



the mouth is always filled with saliva; and if they are of a malignant quality, there is a considerable stench: these dead scabs falling off, the place remains raw and bloody, and these scabs are separated by a suppuration being begun: But if all these things be supposed to happen in the aspera arteria, it is easy to conceive why the voice is hoarse, and why the patient dies consumptive, unless the ulcerated place can be soon cleansed and healed.

Galen also observed, and has described, the like appearances. But that little eschar which Hippocrates describes (*οιον μυκης αφελκεος*), is called by him in a like signification, *ερηλκεις*. And he relates a very extraordinary case of a man who spit a humour very much like viscid bile, which was not acrid, and the quantity of which increased every day; afterwards he wasted away with a gentle slow fever, and he also spit up purulent matter: at four months end, he spit up a small quantity of blood, together with the pus; at last, the fever increasing, and his strength being quite gone, he died consumptive. Galen owns, that he saw afterwards many such instances, in none of which he was able to recover his patient by any care or skill. The other patients whom he saw in this situation, after the first-mentioned case, held out longer than the first; and he tried, for their assistance, every method that the medical art could suggest, but none escaped; and all of them, a little before their death, spit out some part of the corrupted lungs. I once saw a case of this kind in an old man of fourscore, whose spittle was as yellow as saffron, who, weak with age, was subdued by the disease in two months time. This man complained of the bitterness of the matter which he spit out. And Bennet, although he seems to have gathered his remarks

as adest, et vox rauca, sputum liquidum et tenue sput, interdum etiam crassum et velut ptisanæ succum: in ore quoque gravis odor ut a pitibus rudis oboritur, et alias atque alias in sputo dura (*σκληρα*) velut fungi in melle apparent, superiores partes attenuantur, atque adeo totus, malæ faciei rubent, unguis temporis successu contrahuntur, aridi et ex virore pallidi evadunt. Quam primum autem moritur, sanguinem et pus exspuens, nisi curetur, &c. *Ibid.*



marks more from assiduous observation in his own practice, than from reading authors, yet does not appear to be ignorant of cases of this kind: for he says, “Persons whose lungs are affected, bear longer and with less pain and inconvenience the defluxion of mild humours; but defluxions of bilious humours give more uneasiness, and destroy sooner; but men are soonest of all brought to their end by defluxions and excretions of salt, putrid, and thick humours<sup>p</sup>.” Certainly every one will easily believe, that a disease will scarce ever be more accurately described, than by a skilful physician, who has himself been subject to it, his faculties remaining sound in a sick body: for this reason, Sydenham’s account of the Gout is so much esteemed, and Tralle’s history of the Gonorrhœa; thus also Bennet himself was very consumptive, and cured his own disorder.

*Phthisin discutis,  
Non authorum tantum testimonio,  
Sed damno tuo;  
Idem nempe aliquando extitisti  
Et Æger et Medicus.  
Haud facile dictu,*

*Gravius laboraveris, an gloriosius evaseris.  
Tabidorum Theatro prælusorium hoc opus, marcescentis  
olim tui, et pene sceleti, anatome.*

*Securiorem nunquam lector adhibeat fidem:*

*Sensit, curavit, scripsit.*

“Thou treatest of the phthisis,  
“Not only from the accounts of authors,  
“But from thy own sufferings;  
“And thou wast at the same time  
“The patient and the physician.  
“It is not easy to say,  
“whether thy disease was more grievous, or thy  
“recovery more glorious.  
“This work, the prelude to the *Theatrum Tabidorum*,  
“was the anatomy of thyself wasting away, and al-  
“most reduced to a skeleton. In no other author can  
“the reader more securely confide, than in him who  
“suf-

“suffered, who cured, and who described the disease?”

Sometimes it happens, that calculi are generated in the lungs. I have seen such matter thrown up by a cough, friable and like plaster, sometimes much harder, of a rough figure: for the most part, an hæmoptoe follows on a violent and continual cough, as also if a rough jagged calculus, agitated by a cough, have lacerated some of the vessels of the lungs: sometimes there is a long dry cough; afterwards the patients spit up pus, and waste away by slow degrees. Willis asserts, that in the bodies of several who had died of a consumption, “he found the lungs quite free from any ulcer, but obstructed all over with tubercles, stones, or sandy substances.” Hence he disapproves of that definition of the phthisis, which supposes an ulcer of the lungs; and chuses rather to say of this disorder, “That it is a wasting of the whole body, caused by a vitious conformation of the lungs.” It is, however, certain, that these calculi often occasion an ulcer of the lungs, as I myself have seen, and almost always bring on an incurable consumption: which Bennet also confirms, saying, “They whose lungs are injured by hard bony substances, or rough stones formed in them, are irrecoverable.” It is true, indeed, that whatever much impedes the function of the lungs, may justly be accounted a cause of a general consumption of the body; for the instrumentality of the lungs in the animal œconomy is of more importance than that of any other viscus, as the lungs are the principal organ by whose action the chyle is assimilated to the form of the solids and fluids of the whole body. Hence, if great part of the lungs should become schirrhous, or grow rigid by calculi, or by gravel obstructing them, a man may be consumptive without an ulcer in the lungs: but it cannot be denied, that these causes often produce an ulcer in the lungs; and that if such pa-

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tients

q Vide Carm. prefixa Theatr. Tabid. Tom. II. sect. i. cap. 6. p. 87.

c Boerh. Instit. Medic. sect. 200, 208.

r Pharmac. Ration. f Tabid. Theatr. p. 110.

tients hold out any long time, a putrid phthisis almost always ensues; although the disorder originally were only a marasmus, from a defect of chyle so perfectly assimilated as to supply the daily loss of solids and fluids which the body sustains even in perfect health. Practical observations altogether confirm this assertion.

Mead has observed, that those persons were most liable to ulcers in the lungs, who had strumous swellings in childhood or youth; and he adds, “ That  
 “ most experienced physician, Ratcliff, used to say,  
 “ that most consumptions in England, and in other  
 “ colder countries, were of the strumous kind; and  
 “ we often see, in dissecting the bodies of patients  
 “ who have died of a consumption, the lungs filled  
 “ with tumours, or indurated glands, which had sup-  
 “ purated, and discharged matter <sup>u</sup>.” But we often see that persons subject to strumous complaints have swellings in the neck which last for many months, or even years, without suppurating; and when they begin to suppurate, some among them only do this, not all of them together. Besides, it is confirmed by many observations, that these tumours lodge also in other viscera; and that, even in the same body, they are composed of different substances: for sometimes they contain a white or greyish matter, of a mealy consistence, more or less soft; sometimes all of them are equally hard and scissile; in some, a matter is contained like lime moistened with water, and which has no roughness to the touch; in others, there is found a calcarious hard substance, rough to the feeling, concreted, as it were, into a fungous stone <sup>w</sup>. In the body of an asthmatic youth, the lungs were found in part ulcerated, and partly full of tubercles containing a chalky matter: the concave part of the liver, the spleen, and the whole mesentery, had great numbers of such tubercles <sup>x</sup>. In a boy who appeared perfectly recovered of a beginning consumption, but who died in convulsions, the lungs were found filled

<sup>u</sup> Monita et Præcept. Medic. p. 46.  
 Medendi, Tom. II. p. 180.  
 latte, Tom. II. p. 91.

<sup>w</sup> De Haen Rat.  
<sup>x</sup> Giov. Mich. Gallo dell' uso del



§. 1205. *Of a PHTHISIS PULMONALIS.* III

filled with tubercles, some of which contained thin pus, others a substance as thick as new cheese <sup>y</sup>.

If, therefore, the lungs be stuffed with such tubercles, and there be contained in them a thick limy matter, which is slowly and difficultly brought to suppurate, a man may perish by a slow marasmus, on account of the action of the lungs in perfecting the chyle being impaired, before a purulent phthisis comes on; which, however, would have ensued, if the patient had survived any longer. There are many curious observations which confirm this <sup>z</sup>. A soldier twenty-five years old was afflicted with a slow fever, a dry cough, a slight oppression of the breast, his face was pale, and his body extremely emaciated. After two bleedings, he was put upon a milk diet; and in the evening he took syrup of white poppies. But nothing did him good. He grew still thinner; his strength decayed; and he died very quietly, without a diarrhoea, the concluding scene of a phthisis. His respiration through the whole course of the disease was not very laborious. On opening the body, the lungs felt as if they were filled with gravel, and in each lobe a great number of small tubercles were discovered, which contained a matter resembling plaster, but much softer. Another soldier twenty-eight years old, emaciated and weak, had a very troublesome cough for eight months, but spit seldom; and when he did, it was tough, white, and never purulent. He could not bear to lie on the left side. Various remedies were tried, but all in vain. Slight sweats succeeded, sudden wasting, a difficulty of swallowing, a loss of speech, and at length death; but he never had a diarrhoea. On dissecting the body, the lungs were found every where adhering to the pleura, and full of very small tubercles, about the size of a grain of millet. When the lungs were squeezed, hard tubercles were felt as big as a nut, some of which contained a white matter resembling soft plaister, one of them only containing pus. In the upper part of the right lobe there was a tumour as hard as stone, and

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<sup>y</sup> Medical Essays, Vol. II. p. 298.  
Anat. &c. p. 124, &c.

<sup>z</sup> Barrere Observat.

as big as a small hen's egg. The celebrated author of these observations justly remarks, that such a disorder, come to its height, was incurable; but when he had traced the symptoms of this disorder in its beginning, he preserved many soldiers, by sending them to a purer air among the mountains.

But at the same time it appears from this instance, that such turbercles, although they were originally hard, and filled with a chalky matter, yet in time suppurated, and produced a phthisis with an ulceration of the lungs; so that they may be reckoned among the causes of a pulmonary consumption, properly so called. These tubercles may indeed be so numerous as almost to destroy the action of the lungs; and then the patient dies of a true marasmus, before they can possibly come to a suppuration; instances of which frequently occur in practice. A purulent spitting, which in some measure relieves, frequently follows an obtuse pain felt deep in the breast, with some difficulty of breathing. The quantity of spit diminishes gradually, the small vomica heals up again, and the patient thinks himself well: but as a new tubercle forms matter and breaks, all the former symptoms return in a few months. I have seen this happen several times repeatedly, and have heard from many skilful physicians that they have seen the like instances. The most part of these patients, however, die consumptive at last; but generally hold out a considerable time, before they sink under this disease: but when from any adventitious cause many tubercles suppurate at the same time, the patients are sooner destroyed.

After a most rainy autumn, in which the south wind was the reigning wind, which also frequently blew the winter and spring following, a cloudy summer followed with scarce any rain, but a south wind prevailing as before, Hippocrates observed, *That just before the beginning of summer, in the summer itself, and in the following winter, many of those who were phthisically inclined before, fell ill of an actual consumption: and to some who were in a doubtful state before, a confirmed*





vessels into pus; a purulent consumption of the whole substance, or of one lobe of the lungs; a continual dry cough, or such only as forces out an abraded spit by concussion; a conversion of the blood flowing to the ulcer into pus; a spreading of the vomica through the lungs, and its bursting into the tubes of the larynx: Sometimes there is a discharge of pus which instantly suffocates, or it is daily and in large quantities carried off by a cough; which pus generally sinks in water, is thick, sweet, fat, fetid, white, red, yellow, livid, cineritious, stringy, and smells like stale roasted meat when thrown on the fire. If the vomica breaks into the cavity of the thorax, the breathing becomes very difficult, and all the symptoms of an empyema appear. See §. 1188, n<sup>o</sup> 4. Now the breathing is worst of all; the blood and chyle are converted into pus; the succus nutritius can no longer be prepared; the solids are wasted; there is a hectic fever, with a small and languid pulse; a pungent heat in the upper parts of the body; the cheeks flush, and the face becomes hippocratic; an inexpressible anxiety, especially towards the evening; great thirst; profuse night sweats; red pustules; a swelling of the feet and hands of the affected side; great weakness; a hoarse voice; a falling off of the hair; an itching all over the body, with watery pustules; a diarrhœa, with yellow, putrid, purulent, and cadaverous stools, with a tenesmus, that weakens greatly; a suppression of the spit; and at last death.

A vomica, or concealed ulcer, is now formed in the lungs; but before (§. 406.) in treating of an Abscess, all those evils were enumerated which follow from pus long retained in an abscess. It was there said, that  
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the pus grew acrid, putrefied, and corroded the parts within its reach. If now these effects of pus retained and accumulated are applied to an abscess seated in the lungs, it is very evident how great evils are to be feared from thence; of which mention was also made (§. 835, 836.) where we treated of a vomica of the lungs, formed after a peripneumony. It is true indeed, that after violent inflammatory disorders of the lungs, larger vomicas are usually formed than are observed in many phthical people; in whom, as we said in the foregoing aphorism, only lesser tubercles arise, which are used one after another to suppurate, break, and discharge themselves by spitting; and thus, preying by little and little upon the lungs, bring on a slow consumption: in the mean while, if there are a greater number of such tubercles which suppurate, and pretty close to one another; or, if they do not break soon enough, that is, as soon as each of them is ripe; they may, by length of time, and the gradually increasing quantity of pus, be changed into a vomica of a considerable size; concerning which, the reader may consult the remarks on §. 1185. Now although a vomica of the lungs is never without danger, yet experience teaches, that many more persons recover, when, after a suppuration in consequence of a pleurisy or of a peripneumony, they spit a larger quantity of pus at once, than when the pus is collected in smaller tubercles in the lungs. Dr Mead affirms the same: "This disease, although it be dangerous and often ends in a consumption, yet is not so dangerous as those smaller ulcers <sup>a</sup>." Hippocrates ventured to promise recovery to those who had vomicas in the lungs after pleurisy or peripneumonies: His words are, *They in whom suppurations are produced in consequence of a pleurisy or a peripneumony, do not die, but recover* <sup>b</sup>. But when, not after violent inflammations, but from other causes, a small vomica was formed in the lungs, then he feared worse consequences; for he adds, *Per-*  
sons

Monita et Præcept. Medic. p. 53.

<sup>b</sup> Et quicumque ex peripneumonia aut pleuritide suppurati sunt, minime moriuntur, sed sani sunt. *De Locis in Homine, cap. 7. Charter. Tom. VII. p. 366.*

sons also have pus formed, when they spit out less than is thrown on the lungs by defluxions : for that humour which falls upon the lungs and stops there, becomes pus ; but pus fixing in the lungs, ulcerates and putrefies<sup>c</sup>. But that he had respect here to tubercles of the lungs, is evident from another passage, where he thus describes them : *Tubercles of the lungs take rise thus : When phlegm or bile is lodged, there it grows putrid ; and as long as it remains crude, it excites a slight pain, and a dry cough ; but after it is ripened, an acute pain is felt in the fore and back part of the chest, heats moles, and a violent cough. And if as soon as it is ripe it bursts, and finds a passage upwards, and is quite spit out, and the tumour which contained the pus subsides and dries up, the patient recovers. But if it grow ripe, and immediately burst, and a spitting comes, yet it is not quite evacuated, but the tubercle continues to discharge pus upon the lungs, this is fatal ; and phlegm flowing from the head and the chest of the body on these tubercles grows putrid, and pus is formed and is spit out, and the patient dies phthysical, with a diarrhœa<sup>d</sup>.*

Physicians and surgeons know, by daily experience, that there is great difference even in the method of curing external ulcers. An abscess from a violent inflammation is opened as soon as it is ripe ; and thus the matter is discharged, the tumour subsides, and at length consolidates. But when scrophulous tubercles suppurate, how slowly do they proceed, how tedious to cure, what disfiguring and deep scars remain ! When scorbutic ulcers break out in the legs, they prey upon

<sup>c</sup> Suppurati enim fiunt, quam minus exscreant quam ad pulmonem defluat. Quod enim in pulmone consistit et defluit pus sit. Pus autem, in pulmone et thorace consistens, ulcerat et putrefacit. *Ibid.*

<sup>d</sup> Tuberculum vero pulmonis ita oritur : Quum pituita aut bilis orta fuerit, putrescit ; et quamdiu quidem adhuc crudum fuerit, tum dolorem tenuem, tum tussim siccam excitat ; postquam vero maturuerit, anteriore et posteriore parte acutus dolor oritur, calores invadunt, ac tussis vehemens. Et si quidem pus quam citissime maturuerit, eruperit, sursum vergat, ac totum expuatur, venterque in quo pus erat concedat ac resiccet, prorsus sanus evadit. Si vero quam citissime ruptum fuerit, maturuerit, ac repurgatum fundat, perniciosum est illud, et a capite ac reliquo corpore pituita ad tuberculum defluens putrescit, et pus gignitur, ac expui ur, quo corruptus perit. Perit autem ex ventris profluvio. *De Morbis. lib. i. Charac. Tom. VII. p. 540, 541.*



upon all the adjacent flesh, and elude the art of surgery, unless the scorbutic acrimony of the humours can be corrected. Hence it appears why large vomicas in the lungs are often happily cured, while small tubercles are so difficult to heal. It has before been shewn, that tubercles have been found in consumptive persons, which contained so hard a matter, as not at all, or with great difficulty, to be brought to suppuration: And we have seen that an hæmoptœ, and afterwards an ulcer of the lungs, is sometimes caused by an erosion of the vessels from the acrimony of the fluids mixed with the blood. Whence it is easy to see, how difficult the cure must be, when, after one of these tubercles has suppurated and burst, the same vitious disposition remains in the blood; from whence the same evil may spring up afresh, or at least the cavity of such a vomica may be hindered from being cleansed and consolidated; nay, new pus will continue daily to gather in it. Then things are in the situation which Hippocrates describes in the passage above quoted, where he says, “It cannot be dried up, but the tubercle pours forth pus from itself.” When, therefore, a spitting of blood continues long without diminishing or increasing, it is deservedly reckoned a very bad sign; wherefore Hippocrates observes, *They who have tubercles in the lungs, spit pus for forty days after such a tubercle breaks; if the spitting continues longer, they generally become consumptive*<sup>c</sup>.

In treating of the Pleurisy, §. 890, no 1. It was observed, that Van Helmont held a pernicious acid fixed in the pleura and spaces between the ribs to be the cause of that disease; and that he called it the *pleuritic thorn*, which he would have plucked out, or so blunted at least as not to hurt: as a thorn in the finger produces an inflammation and suppuration unless it be drawn out, he would have it that the case was exactly the same in his *spina pleuritica*, and disapproved entirely of bleeding in this disorder. It is certain, that  
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<sup>c</sup> Quibus in pulmone tubercula sunt, pus educant ad quadragintas dies post ruptionem; hos vero transgredientes, plerumque phthisici fiunt. *Coac. Prænot. n° 404. Charter Ton. VIII. p. 876.*

by the suppuration raised in the finger the thorn is forced out together with the pus, which sticking in the finger caused both the inflammation and suppuration: and it is equally true, that by other suppurations those vessels which are stopt up with an inflammable matter too hard to be resolved, are separated from the neighbouring vessels; and this being done, the pus evacuated, and the wound consolidated, the disease is cured. But Helmont himself had observed, that it was not always so very easy to cleanse such ulcerous cavities, and to consolidate the wound when cleansed, on which account he says in his own singular style f, “ For the thorn being pulled out, the re-  
 “ maing disorder easily ceases, unless the thorn by its  
 “ long stay have made the abscess itself thorny: for  
 “ an imposthume or ulcer once formed, altho’ they  
 “ have no root of their own in the place itself, nor are  
 “ supported and supplied from other parts, keep their  
 “ ground by their own power and force without any  
 “ foreign aid. We should be solicitous therefore for  
 “ plucking out the thorn. The obstinacy of a phthi-  
 “ sical ulcer consists in this, that altho’ the original  
 “ thorn is gone, the ulcer itself is become thorny.” By  
 a thorn, this author means every cause that is capable of producing an inflammation or a suppuration; but as such an ulcer of the lungs cannot easily be cleansed and consolidated, it daily collects new matter. The reasons of this difficulty will be explained when we treat of the Cure of a phthisis. But by a constant suppuration the whole substance of the lungs may be consumed and destroyed; as we see, in external parts, fistulous and sinous ulcers not only consume the membrana adiposa, but also the muscles, and even the very bones themselves: and it has been observed, in dissecting the bodies of such persons as have died of a consumption, that the lungs have been consumed in whole or in part. We took notice before, §. 1199. that polypous concretions spit out sometimes in coughing, after an hæmoptoë, had deceived physicians by their appearance, so as to make them think that some  
 blood

blood-vessels of the lungs had been spit up : but it seems possible, that by a long suppuration some of the bronchia of the lungs may be so loosened from the neighbouring parts to which they cohered before, as to be spit out; although some have doubted of this. Galen indeed, as we noted before, §. 1205, has observed, that some consumptive persons spit out part of the corrupted lungs. Bennet attests, that he has more than once seen “ the substance of the lungs so ground down and dissolved, that it seemed reduced to a putrid mass resembling mud<sup>g</sup>.” Nay, he says, “ that in those whom a violent and hasty consumption had destroyed, he found the lobes of the lungs torn, and as it were gnawed, as if a mouse had bit them.” I remember myself to have seen like appearances in bodies opened; and a considerable number of like observations are to be found in Bonetus and many other authors. Diemerbroeck, whose testimony alone is sufficient, not only found the lungs so ulcerated, that scarce half of them was left entire; but in a man who died consumptive, from a wound in the thorax being neglected two months after it was inflicted, “ he found the whole lobe of the lungs on the wounded side so entirely consumed by suppuration, that no portion of it remained; and one would have thought, no such viscus had ever existed on that side<sup>h</sup>.” This instance is the more worthy of note, as Diemerbroeck, who was the professor of anatomy at Utrecht, examined the body with the utmost care, in presence of another physician and two surgeons, to the end they might give an account to the magistrates, whether the wound inflicted so many months before was the cause of his death.

It may seem wonderful, that in such a case the patient did not rather die of a sudden hæmoptoë, as the right ventricle of the heart would propel the blood through the pulmonary artery into the wasted lobe of the lungs, This indeed sometimes happens, but rarely, and the patients much oftener die of a slow consumption. Very many instances certainly shew, that  
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<sup>g</sup> Tabid. Theatr. p. 64.

<sup>h</sup> Anat. lib. ii. cap. 13. p. 310.



when a suppuration is begun there is less danger of an hæmorrhage. We see this in wounds and in amputations. When in persons subject to an hæmoptoe (even when they have had returns of this complaint) a suppuration begins, the spitting of blood soon ceases; although a constant cough, and that sometimes violent enough, remains. I have seen the whole kidney so consumed by an ulcer, that nothing was left of it but the external membrane; yet there had no blood come out with the urine, but only pus. Perhaps some particulars might be found in the fabric of the lungs which would account for this difficulty. It is known that the lungs are divided into large lobes, and these again are subdivided into smaller lobes, each of which divisions a branch of the pulmonary artery enters, a large branch for the great, and smaller branches for the small lobes, of which the great lobe is composed. Ruysch, examining the structure of the lungs, found, "that the blood-vessels of one lobe had no communication with those of another, a membrane dividing each from each. Nay, the membrane of each small lobe wraps up that lobe only, and the branches of the vessels do each of them supply only that lobe to which they belong." This (says he) I found to be the case in a calf's lungs; but that the same arrangement did not always (if ever it did at all) prevail in human bodies<sup>l</sup>. However, in another place<sup>k</sup> he demonstrates the subdivision of the greater lobes of the lungs into innumerable minute lobes. Helvetius<sup>l</sup>, on examining the structure of this viscus, found, that the arteries do not pass from one lobe to another, but each of them supplies its own peculiar lobe, and that the larger branches run between the lobes. Lieberkuhn, than whom there never was a more skilful inquirer into the structure of the viscera, and whose too early death all good men lament, completed this discovery, and shewed a preparation of a part of the human lungs (in which the external membrane was taken off) divided into small lobes, which were suspended from the aspera arteria: he injected with

<sup>l</sup> Mus. Anat. five Catal. Rarior. p. 134.  
n<sup>o</sup> 92.

<sup>k</sup> Thefaur. Anat. VI.  
Acad. des Sciences, 1718. Mem. p. 38.

three different branches of the arteries, and one vein, with an injection of four different colours; and by this means exhibited an evident proof, that there is no communication between the lobes by the blood-vessels: and hence we may comprehend, how some one small lobe of the lungs may have its vessels obstructed, may be inflamed, and suppurate, without communicating the disease to the neighbouring lobes. Thus we understand how a slow consumption may gradually prey upon the lungs, without bringing on a sudden and mortal hæmoptoë, as the disorder creeps by little and little from one lobe to another, and small arterial branches supply each lobe with blood, the circulation thus remaining unhurt and free through that part of the lungs which is still sound; also from the consideration of this structure of the lungs, we see what those tubercles in the lungs are, which physicians have so often observed to be inflamed and to suppurate successively.

It is, however, to be confessed, that the lungs are not always found consumed in the bodies of persons who have died of a consumption, although a very great quantity of pus had been spit out daily, and the physicians have suspected from thence that the whole viscus was consumed. I freely own, that this has happened to myself: And there was a singular instance of this kind in the hospital at Vienna<sup>m</sup>; where, after a very copious discharge of pus, by spitting, the lungs were found entire, but adhering on every side to the pleura, and to the pericardium on the left side of the thorax; but which way soever they were cut, not a drop of pus, nor the least marks of a vomica, were to be found: on opening the trachea, however, some pus was found there. But certain experience shews, that a suppuration does not always consume the part from whence the pus arises; and yet that when a great quantity of pus is daily excreted, the body wastes away. After an amputation of the breasts, or of the limbs, surgeons often, to their great regret, see their patients waste away, while an excessive quantity of pus is discharged from the wide surface of the wound; so that

all the fluids of the body, turning successively to pus, are evacuated; and the patient, who in the beginning seemed in a fair way of recovery, dies quite exhausted. But a short time before death all the wide surface of the wound grows dry, and after death no traces of any pus appear. I have seen very large ulcers in the legs, which had discharged every day, for many years, an incredible quantity of fetid ichor; and after that, by the use of the bark, good pus began to be formed instead of this ichor, the wound began to cicatrise, and there did not seem to have been any great loss of substance after the wound was quite closed up and consolidated. Before, at §. 158, n<sup>o</sup> 7. It was observed from Hippocrates, that ulcers dried up when the patient was near death; on which account, he reckoned the drying of an ulcer a mortal symptom. If this also happens in a phthisis, but little pus will be found after death, and that little scarce any where but in the bronchia, as patients have not strength left to cough and spit when near their end. Whence Hippocrates observes, as we shall see hereafter, that a suppression of spitting in consumptive persons is a token that death is very near.

Hence also the reason is clear, why, when one lobe of the lungs is purulent, the pus is sometimes found on the other side of the lungs; for while the patients, now become very weak, endeavour to spit, but cannot, the pus is pumped up into the aspera arteria, from whence it may fall back to either lobe of the lungs. Dr Simpson<sup>n</sup>, in dissecting a man who had discharged a great quantity of blood before his death, found a schirrhus on the upper part of the right lobe of the lungs; and at the same time a sinus full of pus, big enough to contain a man's finger: he found also a calculus, and a quantity of water, in the right cavity of the breast. But the left lobe of the lungs appeared sound, well coloured, without any hardness; and he was surprised to find pus come out every where, when he cut the substance in different places: but the pus did not issue in large quantities together, but by a drop



drop or two only at a time; so that it is probable it came from the branches of the aspera arteria, as they were successively cut open.

A continual dry cough.] So long as a tubercle, or a larger vomica not yet broken, presses upon and irritates the adjacent parts, this produces a cough, which is either entirely dry, or at most a little mucous only is forced away by the agitation of the lungs in coughing; but nothing of pus as yet appears in what is spit up. Concerning this, let the reader look back to what we said at §. 834, 835, 836. of a vomica of the lungs. Coelius Aurelianus called these, *sputa limpida*; and says, while they kept this appearance, "the patients were not yet to be accounted actually phthysical, but to be judged prone and inclinable to a phthisis <sup>o</sup>." As the principal hope of cure in a vomica is in its soon breaking, and then being capable of being cleansed and consolidated, we see why, if the vomica remain closed, the danger is greater. Hippocrates tells us, *They who have a difficulty of breathing, and afterwards spit up many crudities in a consumption, are in a dangerous way*<sup>p</sup>. Duretus <sup>q</sup>, in his comment on this place, would have us read *πληρωσει* instead of *ξηρασει*, so as to make Hippocrates deduce the difficulty of breathing, not from want of moisture, but from a fulness of the lungs oppressed by a putrid vomica. And certainly, if these persons throw up many crude humours, the cough cannot be called a dry cough. Ben-net lays down the following general practical rule, "If the organs of respiration retain any matter very long, this shews that the cure will be difficult<sup>r</sup>."

A conversion of blood flowing to the ulcer into pus.] When we treated of Wounds at §. 158, n<sup>o</sup> 7. we said, that pus was formed without the vessels, but that the matter from whence it was formed was brought to the place by the vessels. Nor does it seem to be the red blood which is changed into pus, but rather thinner fluids secreted from the blood: for so long as the

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wound

<sup>o</sup> Morb. Chronic. lib. ii. cap. 14. p. 422.

<sup>p</sup> Difficulus spirantes, ex siccitate multa cruda educentes in tabe, perniciosi esse habent. Coac. Prenot. n<sup>o</sup> 445. Charter. Tom. VIII. p. 878.

<sup>q</sup> In Coac. Hippocr. p. 321.

<sup>r</sup> Tabid. Theatr. p. 109.

wound is bloody, we see no pus; but afterwards, the vessels contracting, the surface of the wound grows moist with a thinner humour, which gradually turns to pus on the surface of the wound, if it be guarded from the air; for if the wound be exposed to the air, it all dries up, and a scab covers the wound, under which scab pus is formed. We there saw also, that found humours were turned to pus, and that these even made pus sooner than diseased humours; for when once pus has appeared in a wound, if it be wiped away, new pus is formed again in twelve hours time, or even sooner: but an inflamed humour requires longer time before it can be converted into pus, and perhaps it turns to pus so much the more slowly by how much it is more dense and viscid, or by any other qualities recedes most from the condition of healthy fluids. Thus we shewed before (§. 830.) that a peripneumony was successfully cured by a spitting of thick yellowish matter, mixed with a little blood, and soon changing to a bland whitish saliva, which kind of saliva is certainly altogether like pus. Thus we observe, that mild quinsies suppurate soonest. We shall see hereafter, that in the mildest kind of small-pox the eruptions come out slowly, but ripen soonest. As, therefore, the blood of the whole body must necessarily pass through the lungs if once a suppuration is begun in this viscus, it will not appear strange that the quantity of pus should increase daily, and that the vomica while it is confined should be enlarged more and more; or, when it breaks, that new pus should continually be generated, which will as constantly be discharged by spitting; and thus by degrees all the fluids in the body may be converted into pus, unless this ulcer in the lungs can be cleansed and consolidated. We observed before, that more men recovered after the discharge of pus from a large vomica, than when a smaller ulcer preyed upon the lungs. Cœlius Aurelianus seems to have made this distinction, when he says, “A purulent disorder is distinguished from a phthical complaint, no otherwise than by a col-  
lec-

“ lesion of ulcers.” Now he had called this empyetic disease, before, a *purulent* or *vomifluous* disorder: but he adds afterwards, “ Empyetic persons often discharge the collected quantity of pus, and after this evacuation are relieved from the fever and shiverings which they had before, so as either to be entirely freed from them, or at least in good measure: in phthical persons, the symptoms we have mentioned precede; and by degrees, humours not accumulated, and less dense, are discharged; and the fever increases as the disease increases.”

If now a larger vomica of this kind be formed in the lungs, and, after breaking, is not soon cleansed; or if a small tumour, gradually creeping on, preys on the contiguous part of the lungs, which has not yet suppurated, nor has had a vomica formed in it; at length this whole viscus may be consumed, as we observed before, or at least the liquids flowing to the lungs may be daily converted into pus, which is evacuated by spitting; and thus the wretched sufferers will waste away slowly, although the lungs may be found entire after death: for if the passage be free for the pus into the trachea, no quantity of it will be accumulated; but it will be spit out as long as the patients strength lasts, and their sides are firm, to throw out the pus by coughing. Hence we may also understand, why patients sometimes hold out so long under this disease; that it is when some small lobe of the lungs only suppurates, and the contagion does not reach the neighbouring lobes, or extends to them but slowly. Galen said of these ulcers of the lungs, *Those which have remained long in the lungs, although they are sometimes cured, yet they leave behind them something callous and fistulous, which in process of time will turn to a sore from slight causes.* Willis attending to such old ulcers of the lungs, said, “ A kind of ulcerous cavity is formed in the lungs, which has its sides all round cal-

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“ lous,

\* Morb. Chronic. lib. iv. cap. 14. p. 412.

† Quæ vero in pulmone jam longo tempore remanserunt, quamvis aliquando curentur, relinquunt tamen in ipso callosum quid et fistulosum, quod tractu temporis levi occasione excoriatur. *De Locis Affect. lib. iv. cap. 8. p. 467.*



“ lous, so that the matter collected there does not at all  
 “ pass into the mass of the blood, but all of it, copious  
 “ as it is, is daily expectorated. Persons in this situa-  
 “ tion, as tho’ they had only an issue in their lungs,  
 “ although they spit up a large quantity of thick mat-  
 “ ter, which is even yellow, and as it were purulent,  
 “ every morning, or at some little quantity through-  
 “ the rest of the day, are yet in other respects in to-  
 “ lerable good health; they breathe freely, eat and  
 “ sleep well, are in good case, or not however exces-  
 “ sively emaciated, and sometimes live to old age.”

I myself have seen some such instances; one, especially, of a person of distinction, who died upwards of seventy: I saw him for four years before his death, spit out every morning some ounces of white well-digested pus with great ease, and in the rest of the day he frequently spit out the like matter. He solemnly affirmed he had spit out a like quantity for thirty years; and this was confirmed by physicians deserving of credit, who had known him long, and had formerly been consulted by him; he followed his usual employments to his death, and used a pretty high and plentiful diet, having a good appetite. Several such instances are to be found in Schenckius \*.

Bursting, &c.] We have spoken already at §. 836, no 2. of the danger which attends the sudden breaking of a large vomica of the lungs, and its pouring a great quantity of pus all at once into the trachea: but this does not often happen in a phthisis, in which, for the most part, these patients spit pus daily, and waste away gradually.

Daily, and in large quantities, carried off by a cough.] In external ulcers, the great hope of cure consists in the free secretion of pus daily from the surface of the wound; and that no part of the pus be retained long, and being rendered acrid by time may injure the sides of the cavity in which it is lodged. Whence, as was said before at §. 413. *et seq.* the fistulæ and sinuses will with difficulty be closed up, unless

\* De Medic. Operat. sect. i. cap. 6. p. 163.  
 Medic. Rarior. p. 260.

† Observ.

less the pus be hindered from remaining long in them: which is best effected by cutting asunder the whole cavity, in which the pus is collected; then the sides of such a cavity, by suitable remedies, may be so cleansed, as to be brought to the condition of a simple wound; and thus a perfect consolidation may be obtained. But as such methods cannot be taken in curing an ulcer of the lungs, we see the reason why the cure is so difficult.

The more the matter spit up in this disease deviates from the qualities of laudable pus, the less hope there is of a cure: for whether this proceeds from the nature of the matter being too long retained in a fistulous ulcer of the lungs, and rendered more malignant by its stay; or whether the ulcer itself constantly pours forth a sharp ichor of a different quality from good pus; there is always danger, lest the evil should extend itself more and more; or that the pus, rendered both more acrid and thinner by delay, being re-absorbed, should infect the whole body in such a manner as to make it unfit for nutrition, and thus cause it to waste away; (see to this purpose what is said §. 406. of the hurt done by pus too long retained:) Wherefore in all those persons who have held out many years with an ulcer in their lungs, there was a free and constant excretion of good pus.

The appearances in the pus, which denote it to be of the laudable sort, were mentioned before at §. 387. to wit, that it should be white, smooth, of one colour throughout, not at all fetid; and that is accounted the worst kind, whose qualities are most remote from these: and again, as will be afterwards shewn, it is esteemed a hopeful sign when bad pus is so much mended by a proper diet and suitable remedies, as to gain a greater resemblance in its appearance to the good sort. For this reason physicians attentively examine the spit of phthysical persons, in order to form a just prognostic. Hippocrates observes, that *if it sinks to the bottom when thrown into salt water, they soon die*<sup>w</sup>. After

<sup>w</sup> Phthysicorum in aquam salis exspuentium, sputa si ad fundum tendant cito pereunt. *Ceac. Prænot.* n<sup>o</sup> 435. *Charter. Tom. VIII.* p. 877.

ter him, almost all physicians have condemned that spit which is dense, and which sinks when received in water; and have reckoned this weight of the matter a sign, that some part of the solids, which are beginning to waste, make part of the matter excreted, and being heavier than water sink in it. For pus alone does not swim in water; although I have sometimes seen, that a part of what the patient spit up has swam, and another part has sunk. For this reason Hippocrates seems to have directed, that the trial should be made in salt water; for as this is specifically heavier than fresh water, a greater density and weight is necessary in what is spit out, to make it sink to the bottom; and therefore this circumstance affords a more certain preface. But it is to be noted, that this holds only in saliva, which is only purulent and not mucous also; for the mucus which lines the trachæa and bronchia is always frothy, and contains air bubbles: If this mucus, therefore, be mixed with the pus, or by its viscosity adhere to the outermost edge of it, the purulent spittle will swim on the water, although, properly speaking, the pus itself is heavier than water: from hence also we understand, why some part of what is spit out sinks to the bottom, and another part swims, though both were excreted at the same time. Hence also appears the reason why that which swims at first, afterwards sinks; which sinking happens when the mucus mixed with the pus, or adhering to its edges, is dissolved by the water, and the air-bubbles inclosed in the mucus are dispersed. These trials are best made, when, after sleep, the concocted pus is spit out, by means of a slight cough, and without straining; for then scarce any mucus is forced away along with it, but pure pus only is excreted. Thus things are in the situation which Bennet describes, when he says, “ In spitting up matter, that which  
 “ lodges about the upper part of the trachea is brought  
 “ off without straining, by a slight cough; but that  
 “ which has its seat at the bottom of the bronchia, is  
 “ brought up with difficulty \*.” This same author

con-



confirms by his own observations, what Hippocrates had said, enumerating among the mortal symptoms in a consumption, “thick, muddy, weighty, ash-coloured pus, which, on being thrown into the water, easily, as it were, mixes with it, or subsides to the bottom <sup>y</sup>.”

It has also been observed, that the matter spit up in consumptions has various tastes. Hippocrates mentions, *sputum crassum, ex virore pallescens, et dulce, per tussim rejici*; “the spitting up with a cough thick matter of a pale green colour, and of a sweet taste <sup>z</sup>.” Soon after he says, *Sputum ore continens excreaturus illud detestetur*; “The patient holding his saliva in his mouth, abhors to spit it out, on account of the ill taste.” In the *Prænotiones Coacæ* he says, *Qui suppurati futuri sunt, primum salsuginosum spuunt dein dulcius*; “They in whom pus is about to be, first spit out salt saliva, and afterwards sweeter <sup>a</sup>;” where perhaps by *sweeter*, he understands less salt. I have sometimes heard such patients complain of the nauseous sweetness of their saliva, when they had just spit up pus. And Bennet formerly seems to have looked on this sweet saliva as a very suspicious symptom; and says, “he had seen some from the loss of the nectar of life, (as he calls the nutritious juices) who died faded, withered, and dried up <sup>b</sup>.” For he thought the nutritious juice was excreted by this sort of spitting, and that the patients died by a wasting or marasmus. And he was confirmed in this opinion; because, in the body of a man who died after such a spitting, and who had sometimes spit blood, “all the organs of respiration, and all the viscera, appeared sound to the sight; but the lungs were universally become soft, and had lost their tone:” as also because “this sort of saliva when put on the fire, like all nutritious juices, acquired by heat the consistence of a whitish jelly.” And his remarks confirm the opinion of Hippocrates: “This sweetish saliva

<sup>y</sup> Ibid. p. 104. <sup>z</sup> De Morbis, lib. ii. cap. 17. Charter. Tom. VII. p. 569. <sup>a</sup> N<sup>o</sup> 403. Charter. Tom. VIII. p. 876. <sup>b</sup> Tabid. Theatr. p. 66, 67.

“ liva had been preceded, in all those whom I remember to have seen, by a long ptyalism, in which the saliva was mostly brackish.”

But he reckons that spit best of all which has no taste: for he observes, “ that consumptive people frequently spit up matter that has no taste, but these waste more slowly, although they have some original defect in the lungs<sup>c</sup>.”

Very fetid spittings are of worse presage, as they indicate a putrefaction already begun: yet Bennet seems to think that they are not always a fatal symptom; for he says, “ The purest blood will grow putrid if it be deprived of its vital heat<sup>d</sup>.” Certainly grumous blood, or pus lodged in the bronchia, may soon corrupt, from the free access of air, and the heat and moisture of the place. For this reason, he farther observes<sup>e</sup>, that a stinking breath is one of the worst signs; but joins with it a very laborious respiration. I have seen patients whose expectoration was most fetid, and who yet lived a long time afterwards. In particular, I saw this with surprise, in a youth, who spit up such very fetid matter in the morning, especially when he coughed, that I (who am not so nice as to be so easily affected with these kind of things) was scarce able to endure the stench: he had laboured under this disease for a long time before this fetid spitting began, and lived after it had began for two years, following his daily work; but then the quantity of matter spit out suddenly increasing, he soon wasted away and died. From this instance, I understood why Hippocrates had said, *That those who are suppurated, and find themselves much better, if afterwards a fetid spitting comes on, they relapse and die<sup>f</sup>.*

It is not safe to be much conversant with persons in this stage of a consumption, as the putrid effluvia of the spit may be drawn in with the air, and infect the lungs. Hence Galen says, *Moreover, it is dangerous to be much conversant with persons in a phthisis, and, generally speaking, with any such persons whose breath is*

<sup>c</sup> Ibid. p. 110.

<sup>d</sup> Ibid. p. 44.

<sup>e</sup> Ibid. p. 105.

<sup>f</sup> Quos suppuratos, mitius habentes, sputorum graveolentiæ sequuntur, eos recidiva occidit. *Coac. Prænot. n° 406. Charter. Tom. VII. p. 876.*

so fetid as to communicate an ill smell to the chamber where they lie <sup>s</sup>." And indeed, the youth of whom I have just made mention, infected his sister, and the maid, who attended him constantly in his disorder. Tulpius confesses, that he was once desirous to have examined what injury the lungs had suffered in the body of a person dead of a phthisis; but adds, "The phthifical fetid smell deterred us from dissecting, lest we might have been as much hurt by it as his relations had been <sup>h</sup>." Bennet <sup>i</sup> had seen in the bodies of phthifical persons, the lungs reduced to a kind of filthy dregs; whence, it is easy to conceive, what foul effluvia are exhaled by those spittings which they call muddy or clayey. And Bennet remarks, that such kind of spit is always more ponderous than any other. Nay, although the spittle should not be so fetid, something amiss may be feared from the breath of persons dying of a consumption. A man's wife, expiring of a consumption, giving him a farewell kiss, all that part of his chin which her lips had touched, remained ever after smooth, though the beard grew thick all around: however, this worthy man suffered no other harm thereby; but lived many years, without any signs of any disorder in the lungs.

Physicians are used also sometimes to throw what is spit up by consumptive persons on burning coals; and if it has a fetid smell while it burns, they prognosticate certain death near at hand. However, it is certain, that all spittle smells ill when it is burnt; which makes Bennet <sup>k</sup> account this prognostic not so absolutely certain: the greater or less stench of the spittle in burning, may indeed be a sign of a greater or less corruption of the humours. Hippocrates <sup>l</sup> accounted this bad smell a mortal symptom; but adds, *si et capilli a capite defluant*, "if also the hairs fall off from the head."

Are-

<sup>h</sup> Lib. ii. cap. 2.

<sup>i</sup> Tabid. Theatr. p. 68.

<sup>k</sup> Ibid. p. 44.

<sup>l</sup> Aphor. 11. Sect. v. Charter. Tom. IX. p. 200.

<sup>s</sup> Periculosum præterea est consueſcere his qui tæbe tenentur, atque in totum cum omnibus qui putridum adeo expirant, ut domicilia, in quibus decumbunt, graviter oleant. *De Febribus, lib. i. cap. 3* *ibid.* p. 108.



Aretæus acknowledges that there is an infinite variety of spittings in phthifical cafes; and he enumerates many of them. But he tells us, “ they are all  
 “ so many different forms and species of pus <sup>m</sup>:” And then adds, “ they who examine by water or fire the  
 “ humours excreted, do not seem to me to take the  
 “ best means for forming a diagnostic in a phthisis;  
 “ for the sight is more to be depended upon than any  
 “ other sense, whether we examine by it the matter  
 “ excreted, or the appearance and habit of the whole  
 “ body; for if even any common man shall see a per-  
 “ son pale, weak, labouring with a cough, and ema-  
 “ ciated, he will pronounce that he is phthifical.” But Aretæus does not seem to have considered, that physicians do not so much endeavour to find, by examining the spittle in water, or upon the fire, whether the patient has or has not a phthisis; but whether the disorder is likely to bring on death slowly, or soon, as is evident from the aphorism of Hippocrates above quoted.

If the vomica breaks into, &c.] A vomica may certainly burst in such a manner, as that the pus shall be effused into the cavity of the thorax; however, this happens but rarely in phthifical cafes, and for the most part the pus is discharged by spitting: but if such an effusion of pus into the cavity of the thorax does take place, it is easy to see how little hope remains, when the lungs, already ulcerated, are besides deluged, as it were, with pus on every side. If an empyema is difficult of cure when the lungs are sound, what can be hoped when they are already injured? See what has been said of the Empyema.

Now the respiration is worst of all.] For the lungs being almost consumed, as was said before, few air-vessels remain; the pus is often collected in the bronchia, and the patient is too feeble to draw it out from thence by coughing. “ Sometimes a pungent sore  
 “ pain of the breast and nipples, which is rendered  
 “ more intense by coughing, or a tension and pain  
 “ when the patient lies down on the right or on the  
 “ left

“ left side, on account of the lungs adhering to the  
 “ pleura on either side <sup>a</sup>,” suppresses all excretion by  
 spitting, and almost stops the breath. The vomica,  
 before it breaks, by pressing upon those vessels which  
 are yet unobstructed, produces the same bad conse-  
 quences, as we observed before at §. 836.

The blood and chyle are converted into pus, &c.]  
 After amputations of the limbs, there sometimes en-  
 sues so great a suppuration that the patient wastes a-  
 way from this cause only, although the viscera be  
 quite sound, because the nutritious juices are convert-  
 ed into pus, and issue with it through the surface of  
 the wound. In a large ulcer of the lungs, the same  
 consequences must necessarily follow; and, indeed,  
 much more, as the whole mass of blood must circulate  
 through the lungs, and the chyle, as soon as it  
 mixes with the blood, is carried with it through the  
 vessels of the lungs; but, after amputations, only a part  
 of the blood and chyle passes through the places where  
 the amputation was made. Besides, we are taught  
 from physiology, that it is by the action of the lungs,  
 that the chyle is formed into a nutritious juice, to sup-  
 ply the continual waste of the solids and fluids. For  
 this reason, phthical patients waste away from a  
 double cause: both from an effusion of the nutritious  
 juices (flowing from the ulcer, together with the pus);  
 and because, the lungs being weakened by the disease  
 itself, the preparation of a nutritious juice from the  
 chyle is impeded. It often happens, that all the pri-  
 mæ viæ perform their functions well in phthical pa-  
 tients; they have a good appetite, digest their food  
 well, have regular stools, and yet receive no benefit;  
 but the whole habit of body wastes away gradually,  
 because the necessary action of the lungs upon the  
 chyle is defective. This Bennet held for a very bad sign,  
 and says, “ Phthical persons having an eager appetite,  
 “ and not being the better or stronger for what they  
 “ eat, are in a desperate case; for this shews that  
 “ the disease preys upon and exhausts the vital nectar.”  
 The solids are wasted.] For by the purulent spitting

<sup>a</sup> Tabid. Theatr. p. 105.

<sup>o</sup> H. Boerh. Medic. sect. 208.

and nocturnal sweats, the fluids are exhausted; hence the vessels, being no longer distended by the fluids, contract; the fat, on which the plumpness of the body depends, is consumed, and the skin and bones seem only to remain; yet the action of the muscles still continues, and the patients can perform all muscular motions, as far as their great weakness will allow, and as far as the dryness of the ligaments of the joints is not a hindrance. I saw a skilful musician, worn out and emaciated with a consumption, who, the day before his death, played on the harpsichord, and moved his fingers with great celerity. It is known that the size and fulness of the muscles depends on the cellular membrane, interwoven between each bundle of muscular fibres; now although all this cellular coat is wasted away, from the extreme emaciation of the patient, the muscular fibres still remain, and are capable of producing motion. Ovid, in his description of Famine, seems to have drawn a complete image of a person in the last stage of a consumption.

- - - *Cava lumina, pallor in ore,  
Labra incana situ, scabrae rubigine fauces:  
Dura cutis, per quam spectari viscera possent:  
Ossa sub incurvis exstabant arida lumbis:  
Ventris erat, pro ventre, locus. Pendere putares  
Pectus, & a spinæ tantummodo crate teneri.  
Auxerat articulos macies, genuumque rigeat  
Orbis, & immodico prodibant tubera talo.*

METAMOR. lib. viii. ver. 805.

“ Sunk were her eyes, and pale her ghastly hue;  
“ Wan were her lips, and foul with clammy glue;  
“ Her throat was furr’d; her guts appear’d within,  
“ With snaky crawlings, through her parchment skin;  
“ Her jutting hips seem’d starting from their place,  
“ And for a belly was a belly’s space;  
“ Her dugs hung dangling from her craggy spine,  
“ Loose to her breast, and fasten’d to her chine;  
“ Her joints protuberant by leanness grown,  
“ Consumption funk the flesh and rais’d the bone;  
“ Her knees large orbits bunch’d to monstrous size,  
“ And ankles to undue proportion rise.”

VERNON.

A.



Aretæus has most accurately described the wasting away of the whole body in a phthisis, where he also well remarks, “ That the thin part of the cheeks  
“ sticks to the teeth, and give the face a grinning appearance; and that the patient looks in all respects  
“ like a corpse <sup>p</sup>.” Thence also there is that appearance of the countenance called the *facies Hippocratica*, from the description which Hippocrates has given of it in his prognostics; which we mentioned before, (§. 1188.) when treating of the Empyema.

But the body gradually decaying, extreme emaciation ensues; and if this be suddenly increased, it is a sign of near impending death, as Bennet has well observed: “ A contraction of the sides of the nostrils,  
“ the thorax collapsing and growing narrow on a sudden, shews that the patient is near death.”

A hectic fever, with a small, &c.] What a hectic or habitual fever is, we shewed on another occasion, §. 835. from Galen. It is a fever which always keeps the same equal tenor, without any paroxysm, increase, or acme, without intensification or remission, so that the patient does not himself perceive that he is feverish. At the same time we there took notice, that Galen had observed some instances of a periodical augment of this fever; but thought the exacerbation in this case did not proceed from the nature of the fever, but from the taking of food, which when it had been digested and distributed through the body, this fever returned to its old state. In the beginning of a consumption, this fever is chiefly perceptible towards evening; beginning sometimes with a slight shivering, and sometimes without any shivering; manifesting itself by the quickness of the pulse, increase of heat, and flushing of the cheeks; but in the morning the pulse is natural, which gives it the appearance of a quotidian ague. Aretæus has remarked this, saying, “ A constant fire,  
“ or fever, lies lurking in the body, which never seems  
“ to intermit, but lying concealed in the day in sweat  
“ and cold of the body: for this is peculiar to a consumption, that the heat is raised and diffuses itself

“ at night, which in the day-time lies lurking in the  
 “ bowels<sup>q</sup>.” But as the disease grows worse, “ the  
 “ hectic heat increases, and the pulse is quick even  
 “ early in the morning;” and then, Hoffman<sup>r</sup> tells  
 us, there is very little hope of a recovery. It is certain,  
 that sometimes a real exacerbation, and a perfect inter-  
 mission, have been observed in phthical cases; and  
 Hippocrates seems to have observed the same when he  
 says, *In persons in whom pus is formed, intermittent fe-  
 vers are mostly accompanied with sweat<sup>f</sup>.* But it is most  
 frequently observed, that a slight fever is constantly  
 upon the patient, which grows somewhat more intense  
 towards evening; but from time to time there are ma-  
 nifest exacerbations at different parts of the day, ei-  
 ther from the pus being retained, or new chyle enter-  
 ing the blood after new aliment taken in. But when  
 the lungs are obstructed with tubercles which suppu-  
 rate successively, then as each tubercle comes to a  
 head, and is on the point of breaking, the vehemence  
 of the fever is considerably increased; which abates a-  
 gain when the pus is discharged by spitting, till ano-  
 ther tubercle suppurating, brings on another exacerba-  
 tion. For this reason it should seem that Bennet says,  
 “ If an ephemeridal fever, or a hectic coming on at  
 “ unequal intervals, have long oppressed a phthical  
 “ patient, they indicate a fatal issue<sup>s</sup>;” for this shews  
 that new causes of an increase of the fever frequently  
 recur before the former cause is removed. But when  
 the pus, in an ulcer of the lungs, becomes acrid and  
 ichorous, or otherwise degenerates by lodging too long,  
 and not being excreted by spitting; then the whole  
 blood is infected with an acrid and putrid taint, and  
 a putrid malignant fever comes on, which soon de-  
 stroys all the strength which remained, and kills the  
 patient. Bennet having observed these disorders, says,  
 “ Almost all those in whom the matter which op-  
 “ presses the breast produces a putrid malignant fe-  
 “ ver, die<sup>t</sup>.”

Ga-

<sup>q</sup> Ibid.      <sup>r</sup> Medic. Ration. et System. Tom. IV. parte iv. p. 308.<sup>f</sup> Suppuratis febres intermittentes plerumque sudoriferæ sunt. *Coac. Prenot.* n<sup>o</sup> 419. *Charter.* Tom. VII. p. 876.<sup>s</sup> Tabid. Theatr. p. 111.<sup>t</sup> Ibid. p. 112.

Galen <sup>u</sup> gives it as a rule, that the pulse in phthifical persons is small and languid, soft, and moderately quick: this is chiefly the case in the first stages of the disease. But when the habit of the body begins to waste away, then a slender, hard, indistinct, and quick pulse, accompanies the hectic; as Galen <sup>x</sup> has excellently remarked in another place, after he had first accurately painted the wasting of the whole body in a phthisis. At the same time he observes, that when the physician first feels the pulse, the heat appears moderate; but if he keeps his hand on the pulse a considerable time, a kind of sharp biting heat is perceived: sometimes the patients have a troublesome sensation of heat in the palms of their hands. Why the heat is more vehement towards the upper parts of the body, and why there is a flushing in the cheeks, was explained §. 835.

An inconceivable anxiety, &c.] At §. 631. we shewed the cause of a febrile anxiety was an obstructed passage of the blood through the extremities of the pulmonary artery. In phthifical cases, where this viscus is either gradually consumed or filled with pus, this obstruction also takes place; and in a greater degree, as the disease makes nearer approaches to death. The unhappy patients complain of no grievance more, nor more earnestly desire the help of art for any thing, than to gain some relief from this distressing symptom. This oppression increases towards evening, because the spitting grows less at that time, and the fever is heightened; and the faster the blood moves through the obstructed vessels, the more this anxiety increases. If a healthy man augment the velocity of the motion of his blood by running, an anxiety arises, because the lungs cannot give passage to the blood so fast as it is brought by the veins to the right ventricle of the heart: hence, unless the velocity of the blood were slackened again by rest, sudden death would follow, as indeed frequently happens to men and beasts who run beyond their strength. But in the morning,

M 3

when

<sup>u</sup> De Pulsibus, ad Tyrones, cap. 12. Charter. Tom. VIII. p. 10.

<sup>x</sup> De Febris, lib. ii. cap. 10. Charter. Tom. VII. p. 120.



when the fever grows milder, and the matter collected and concocted during the night is spit out, then this symptom abates.

Great thirst, profuse night-sweats.] In a phthisis, the whole body is dried up, and the anxiety shews that the fluids circulate with difficulty thro' the vessels of the lungs. At the same time, the blood is infected with purulent matter, and consequently more acrid; which is another cause of thirst. Add to these, night-sweats, which dissipate the thinner parts of the blood; from which cause alone thirst will arise, even in healthy persons. See what was said of a Febrile Thirst at §. 636. and of Night Sweats at §. 835.

Red pustules, &c.] These often happen when the thinner fluids are carried off by sweat, the thicker being stopped in the narrow extremities of the cutaneous vessels. These pustules appear in healthy people in very hot weather; much more may these be expected in phthisical persons, in whom the pores are less pervious, and the humours acrid; from the same cause an itching arises all over the body. Bennet<sup>y</sup> reckons among the signs of an incurable consumption, “a scurf upon the extreme parts and upon the skin, “with a deficiency of moisture.” And Hippocrates had said before, *Eruptions of pustules appearing like scratchings of nails upon the skin, indicate a wasting of the whole habit*<sup>z</sup>; by which is meant a consumption in its last stage. But in another place we read, *Itchings after costiveness are a bad sign in consumptions*<sup>a</sup>: for by the diarrhoea a great quantity of the more acrid humours is drawn off; but if this be suppressed, either of its own accord through the weakness of nature, or by remedies, then this itching and these pustules succeed.

From the pus being mixed with the blood as it flows through the ulcerated lungs, the whole blood is corrupted,

<sup>y</sup> Tabid. Theatr. p. 105.

<sup>z</sup> Pustularum eruptiones, velut unguibus lacerata cute (τα αμυχαια & χαυθισμαλα) habitus tabem significant. Coac. Prenot. n<sup>o</sup> 444. Charter. Tom. VIII. p. 878.

<sup>a</sup> Pruriginosa corpora post alvum suppressum, in tabidis malum. Ibid. n<sup>o</sup> 440.

rupted, and the crasis of the fluids is so broken down, that they issue from the body in great quantities by a colliquative sweat; but when the vital powers grow weaker and weaker, and at the same time, the most fluid part being dissipated by sweat, the remainder of the fluids is more viscid, then the humours arising at the skin find more difficulty in passing through it, and raise upon the epidermis here and there watery pimples, which are like whitish miliary eruptions, except that for the most part they rise to be much larger. Nor was Hippocrates ignorant of this symptom, as we observed on another occasion, (§. 835.) when we treated of the signs which shew a concealed abscess in the lungs; for in his Prognostics, after he had said, “The eyes grow hollow, and flushings come upon the cheeks, and the nails of the hands grow crooked, and the fingers grow hot, especially at the tops, and the feet swell, and the patient loses his appetite<sup>b</sup>,” he adds, “and pustules (*πυκταίναι*) break out upon the body.” That by *phlyctænæ* he means watery pustules, is manifest from what has been mentioned at §. 723.

A swelling of the feet and hands of the, &c.] In the last stage of a consumption, and when death is approaching, this is observed, that when the body is in the most emaciated state the hands and feet begin to swell. Bennet<sup>c</sup> says with good reason, “In a consumption which has lasted a long time, an oedematous swelling of the feet is a mortal symptom.” Hereafter, in treating of the general causes of a Dropsy, it will appear, that whatever hinders, in any degree, the free return of the lymph through the veins to the heart, may occasion a dropical swelling. Now in the last stage of a consumption, the extreme anxiety shews, that the blood coming from the right ventricle of the heart moves with difficulty through the lungs; whence there is a resistance to the motion of the blood through the veins to the heart, and therefore a more difficult absorption of the lymph by the bibulous vessels. At the same time a small quantity  
of

<sup>b</sup> Charter. Tom. VIII. p. 651.

<sup>c</sup> Tabid. Theatr. p. 111.

of blood moves through the arteries; hence a weak pulse: and as the action of the arteries next the veins cannot forward the venous blood, the lymph will stagnate, and be collected in the parts the most remote from the heart; whence will ensue a cold tumour of those parts, but soft also, on account of the scarcity of moisture in the body, already drained of its juices.

Hence also we see why Bennet says, “ A phthisis, “ accompanied with a sudden lassitude and faintness, “ and also with a coldness of the extremities, especially of the feet, is exceeding dangerous; for this “ is a symptom of a great depravation and exhaustion “ of the nutritious juices, and of loss of strength “ from thence <sup>d</sup>.” Hence also the reason is plain why Hippocrates, describing the progress of a consumption, says, *In the progress, the body is emaciated, except the legs; but these and the feet swell<sup>e</sup>.*

Whether experience confirms what some would conclude from the words in the text, That if the left lobe of the lungs be consumed by an ulcer, the left hand and foot swell before death; and *e contra*, if the right lobe be affected; I confess I know not: at least I have never seen it in the patients whom I have attended; nor do I remember to have found it in good writers, that this has been observed by others.

Great weakness; a hoarse voice.] A person exhausted by a hectic fever, by sweat and expectoration, must soon be reduced to a state of extreme weakness; and the dryness of those parts which are the instruments of speech, must occasion a hoarseness.

Falling off of the hair.] The hairs proceed from a small bulbous root fixed in the cellular membrane, or from the sebaceous cryptæ of the skin. In healthy men they are always oily. But when by age or acute diseases the fat is consumed, the hairs fall off; yet if the bulbous roots remain unhurt, and the former plumpness of the body be restored, they grow again. But as they may be cut or burnt without any pain, and

<sup>d</sup> Ibid. p. 110.

<sup>e</sup> In progressu vero corpus extenuatur, exceptis cruribus: hæc autem tument et pedes. *De Intern. Affect. cap. 2. Charter. Tom. VII. p. 64.*



and when cut grow again, and springing afresh from their root planted in the fat pierce through the skin, hence Galen says, *The growth of the hair is like the springing of vegetables from the earth* <sup>f</sup>. It is not strange, therefore, as in the last stage of a consumption scarce any fat remains, and the skin is quite dry, that the hairs should fall off; and this Hippocrates accounts a symptom of impending death: *If the hairs of such a person fall from the head, and the head is as it were made bald by the disease, and the spit thrown on coals has a fetid smell, be sure he will soon die, and that a diarrhœa will carry him off* <sup>g</sup>. He makes a like prognostic in the *Prænotiones Coacæ* <sup>h</sup>, as also in the *Aphorisms* <sup>i</sup>. All physicians from his time have confirmed the truth of this presage. For altho' phthysical persons before this had profuse nocturnal sweats; yet when, the skin being dried, the hairs fall off, the humours are driven inwards; and, being dissolved by a putrid depravation, rush to the intestines, and bring on a most fetid diarrhœa, which soon puts an end to the disease and life together. Hence Aretæus, after describing most accurately the extreme emaciation of persons in the last stage of a consumption, adds, "If the belly grow loose in such patients, the case is desperate <sup>k</sup>."

Sometimes, although less frequently, it happens that white fæces like chyle are excreted; which is a most fatal sign, as in this case all kind of nourishment is drained from the already exhausted body. Bennet observed this; and pronounces, "If, after a consumption has lasted a long time, a diarrhœa comes on, which evacuates the chyle from the body, this is mortal <sup>l</sup>." And in Cœlius Aurelianus we read what follows: "Then the disease growing more de-

spe-

<sup>f</sup> *Generatio pilorum eadem est ac illorum quæ a terra nascuntur. De Composit. Medic. secund. locos, lib. i. cap. 1. Charter. Tom. XIII. p. 319.*

<sup>g</sup> *Huic si jam capilli ex capite desuant, caputque velut ex morbo jam nudetur, et super prunas expuente sputum graviter oleat, hunc intra breve tempus perituum asserito, et, quod enecet, alvi profluvium fore. De Morbis, lib. ii. cap. 17. Charter. Tom. VII. p. 569.*

<sup>h</sup> *Nº 434, 436. Charter. Tom. VIII. p. 787.* <sup>i</sup> *Secl. v.*  
<sup>k</sup> *Aphor. 11, 12, 14. Charter. Tom. IX. p. 200, 201, 202.* <sup>k</sup> *De*  
*Caus. et Sign. Morb. lib. i. cap. 8. p. 37.* <sup>l</sup> *Tabid. Theatr. p. 111.*

“ sperate, a flux of the belly ensues, bringing away  
 “ white fæces and indigested food, the natural organs  
 “ of digestion being weakened<sup>m</sup>.” And that we are to  
 understand, that such a flux comes on after the dis-  
 ease has lasted a great while, is plain from what went  
 before: “ The ends of the fingers grow thick,  
 “ and the nails grow crooked, (this the Greeks call  
 “ γρυπωγυς); then follows a swelling of the feet, an  
 “ alternate heat and cold seizes the joints, the tip of  
 “ the nose grows pale, and the lobes of the ears grow  
 “ cold.” Now all these symptoms in a consumption  
 foreshew approaching death.

When this fatal diarrhœa comes on, and sometimes  
 a little sooner, the spitting, which was copious before,  
 begins to be suppressed, and a great anxiety ensues;  
 and if the spitting be not restored, by means of a warm  
 diluted drink sweetened with honey, a fatal diarrhœa  
 soon follows. Physicians endeavour to promote the  
 spitting, and, by giving warm oxymel, to raise a  
 cough, in order to remove the oppression from the  
 lungs. But all the efforts of art are often vain; as  
 Bennet also observes: “ When persons have long been  
 “ consumptive, and thin drinks designed to excite a  
 “ cough are given, and no cough is excited, death  
 “ ensues<sup>n</sup>.”

Such is the progress of this most dangerous disease,  
 which destroys so many men in the flower of their age.  
 This progress Hippocrates has briefly, as he is wont,  
 but accurately, thus described: *After spitting of blood,*  
*spitting of pus is a bad sign. After spitting of pus, comes*  
*on a wasting and a diarrhœa. When the spitting stops,*  
*the patients die.*

In the next aphorism follow some general rules of  
 great use in forming a prognostic in this disease.

§. 1207. (1.) **A**N hereditary phthisis is the  
 worst

<sup>m</sup> Morb. Chron. lib. ii. cap. 14. p. 421.  
 p. 112.

<sup>n</sup> Tabid. Theatr.

<sup>o</sup> A sanguinis sputo puris sputum, malum. A puris sputo, tabes et  
 fluxus. Ubi autem sputum sistitur, intereunt. *Seç. vii. Aphor. 15, 16.*  
*Charter. Tom. IX. p. 299.*

worst of all, and not to be cured, but by preventing the hæmoptoë.

(2.) A phthisis arising from an hæmoptoë occasioned by external violence, without any internal defect, is, *cæteris paribus*, the least dangerous.

(3.) A phthisis in which the vomica soon bursts, and easily discharges a white, smooth, and concocted pus, equal in quantity to the size of the ulcer, without thirst, with a good appetite and digestion, and the secretions and excretions as in health, may be cured, altho' with difficulty.

(4.) A phthisis from an empyema is incurable.

(5.) An expectoration of heavy, solid, stinking, sweet matter, with the last signs of §. 1206, extinguish all hopes of a cure.

Mention was made §. 1198. of an hereditary phthisis; and then it was made evident, how very great reason there is to fear that persons should be attacked by this disease, when there is cause to suspect an hereditary tendency to it. For if a person so situated should once be taken with a spitting of blood, we might safely apply to him the poet's words <sup>a</sup>:

*Non est in medico semper relevetur ut æger,  
Interdum docta plus valet arte malum;  
Cernis, ut e molli sanguis pulmone remissus,  
Ad stygias certo limite ducat aquas.*

“ Tho' skilfully the sage perform his part,  
“ Disease oft triumphs o'er the healing art:  
“ The lungs oft bursting in the fatal strife,  
“ Pour forth the purple stream, and let out life.”

The only hope of safety lies in preventing any hæmoptoë; which is to be apprehended in such persons, sometimes as soon as sixteen years old, although it does not often come on before eighteen. If a cough with a defluxion (which may be left to itself frequently in other persons, without danger,) arises in persons

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<sup>a</sup> Ovid. *Epist. ex Pontæ*, lib. i. *Epist.* 3.



so disposed, all efforts must be used to allay this, lest, the weak vessels of the lungs being lacerated by the vehemence of the cough, an hæmoptoë should ensue. Boerhaave preserved the heir of a very noble family, in which this disease was hereditary, by prescribing a proper regimen and diet, and diminishing the quantity of blood by bleeding thrice a-year. Nay, there may be hope by such means to extinguish this hereditary taint in families, of which I have seen a remarkable instance. A robust healthy man married a beautiful young lady, in whose family this disease was hereditary, of which disease she (as well as the rest of her brothers and sisters) died before she was thirty. Of this marriage were born four children, who, although the father was healthy, and lived to upwards of eighty, were all attacked with this disease. Three died of a true phthisis. The fourth and last, terrified by the fate of the rest, prevented, by timely bleeding, the hæmoptoë; and when he was past thirty-six, and by some prudent friends was advised to leave off bleeding, he would not be persuaded: nay, he rather repeated it more frequently, and had a greater quantity of blood taken from him at each time, thinking he might, by that means, more safely indulge his genius; whence becoming dropical from too great a loss of blood, he died about forty. He had children of a healthy wife, who is now alive, and upwards of seventy years old; some of whom died of childrens disorders. One of the daughters died past thirty in child-bed: the two others are yet alive, and have never been afflicted with any disorder in the lungs, through a course of years more numerous than those of their father's life; and happy in a strong healthy offspring, of whom some are grown up to manhood perfectly well. From this instance it appears, that there may be hopes of extinguishing even an hereditary taint, if the hæmoptoë be prevented: at the same time we see, that although a consumption in its worst state is infectious, yet the hereditary taint of the wife did no injury to the husband.

Bennet has observed, that an hereditary phthisis is  
slower

flower in its progress: he says, “ They who have received an inevitable disposition to this disease from their parents, although irrecoverable, yet are longer before they die of it than others<sup>b</sup>. ”

2. It was said before, §. 1198. that an hæmoptoë, occasioned by external violence to the lungs, is much easier of cure, than if an hæmorrhage from the lungs be caused by the erosion of the vessels: for in the first supposition, the humours are sound, and the disorder may be considered as a simple wound, which there are hopes of consolidating. It is indeed true, that the constant motion of the lungs in respiration, and the necessary free access of air, make it difficult for wounds of the lungs to close without any suppuration; so that this is more to be expected than in external wounds, where, by surgery, the lips of the wound may be kept close together, and the air be excluded. In the mean time, if a phthisis begin to arise after such an hæmoptoë, it may be considered as a topical disorder, which has neither a cacochymia preceding it, nor an idiosyncrasy conspiring with it: therefore, all other things being equal, a phthisis arising from such an hæmoptoë will be less dangerous than other kinds, which owe their origin to more pernicious causes; yet neither is such a phthisis as this without danger, as will be shewn under the next head.

3. Before, when we treated of a True Peripneumony, it was observed, that if this disease terminate in forming a vomica, all means should be tried to make it burst speedily, that the pus, being effused into the bronchia, may be evacuated from thence; for this would be the only hopeful method of first cleansing, and afterwards consolidating the ulcer. For, unless the vomica can soon be brought to burst, its size will increase, and compress and obstruct the neighbouring parts; and the whole viscus will be eroded by pus long retained, and thereby rendered acrid. So that if a vomica follow upon an hæmoptoë occasioned by external violence, and this vomica burst soon, there are hopes of a cure; which will be greater, if laudable pus be

discharged by spitting with ease, and without so vehement a cough as may by the agitation of the lungs irritate the ulcerated place, and so prevent the closing of the wound. But, in order to form a more certain prognostic, we are to consider, whether the quantity of pus discharged is answerable to the size of the ulcer. For if this be the case when a vomica soon breaks, that is a sign that it could not contain a very great quantity of pus; and after the whole quantity of pus is discharged from it at the time of its breaking, the quantity of pus spit out diminishes gradually day by day, if the affair is likely to turn out well; as manifestly appears in purulent tumours of the external parts, which are subject to inspection: for if a greater quantity of purulent matter flows out than is proportionate to the size of the ulcer which is opened, the surgeons know that the wound is fistulous, or that the vitious humours flow to the fore; either of which causes render the cure of an ulcer difficult, and still more if this ulcer be in the lungs. Bennet has well remarked this, when he says, “ If there be a copious and frequent  
 “ defluxion on the ulcerated part, there is danger;  
 “ for internal ulcers with an afflux of corrupted hu-  
 “ mours are scarce ever cured, and external ulcers with  
 “ great difficulty<sup>c</sup>.”

On the supposition that nothing amiss internally causes the disease, it is plain, that there will be no vehement thirst; and that the primæ viæ perform their functions well, so as to prepare proper chyle from the food. But we know that the action of the lungs is a principal means of forming good blood, and other juices, from the chyle; so that of necessity, the lungs must remain so far uninjured, as to be capable of performing their office; and we know that this is the case, if the plumpness and vigour of the body do not decrease, but are rather augmented. In the foregoing paragraph it was said, that it was deservedly thought a very bad sign, if a phthysical patient has a strong appetite, and yet continues to grow thin; for then we certainly know, that the lungs fail in performing their func-



functions. The prognostic which we read in Hippocrates on this head, is very accurate; *With regard to phthysical persons, as to what belongs to the spitting and cough, I say the same things as I have written concerning those who have an abscess: for it is necessary, in order to be perfectly freed from the disorder, that the patient should spit easy with his cough; and that what he spits should be white, smooth, and of one colour, without phlegm, (so I think the word ἀρλεγμαντόν is best rendered); and that the defluxion from the head should be derived on the nostrils; and that no fever should come on, no, not in the evening: he should have stools every day, and the stools should be hard, and answering in quantity to the quantity of food. The man should not be much emaciated, the breast should be broad, and having the cartilage not prominent, but brawny and fleshy, (for the cartilages of the ribs stick out in emaciated persons.) Persons in whom all these appearances unite, are likely to recover; they who have not any of them, are very near death<sup>d</sup>.*

But although, in such a consumption as has been just described, there are hopes of a cure, the physician should always remember there is still some danger, and that such a disorder cannot easily be removed. Heretofore, when we treated of the cure of an hæmoptoë, we saw how great care the ancients advised to be taken to prevent the inflammation of the lacerated vessel, lest the suppuration ensuing should make the cure difficult and uncertain. And indeed, unless the cough be gentle, and the evacuation of the pus by spitting easy, we may well say with Galen, *What hope can there be of a cure? The cure is not therefore so desperate, as physicians were of opinion formerly, because the lungs are*

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<sup>d</sup> De tætescentibus, quod ad sputum et tussim attinet, eadem dico quæ de Suppuratis scripsi; oportet tenim eum qui probe liberari volet, facile spumam per tussim rejicere, et id esse album, et æquale, et ejusdem coloris, absque pituita. Quod vero a capite defluxit, ad nares diverti; febrem autem removere, ut ne a cæna prohibeatur. Venter autem egerat quotidie, et id quod egerit, sit durum, copia pro ratione ingestorum. Hominem vero quoniam minime tenuem esse oportet: pectus autem laudare convenit, quæ brevis et hirsutum; et cartilago ejus parvo sit, et robuste carnosæ. Quicumque enim hæc omnia habuerit, maxime superstes erit. Qui vero nullum horum habuerit, interitui proximus. *Prædict. lib. ii. cap. 6. Charter. Tom. VIII. p. 814, 815.*

*in perpetual motion, to draw in and let out the air, but because of the discharge of sanies and pus. If, therefore, immediate care be taken, and such remedies applied, as have been mentioned, the wound closes: but if an inflammation is begun, the cure becomes uncertain and difficult; for the pus and sanies are not entirely cleared away from the lungs, and the cough lacerates very much the injured parts*<sup>c</sup>. Aëtius<sup>f</sup> makes the like observations; and also very justly remarks, that these evils mutually cause and are caused, and succeed one another, as it were, in a circle; as the ulcer irritated by the cough at last is inflamed, this inflammation brings on a gathering and ripening of pus, and the pus so ripened must again be thrown off by a cough. On account of the cure being so difficult, Bennet admonishes, “ That the physician  
 “ should not trust too much to the first gleam of hope  
 “ of health, which breaks out in this disorder, altho’  
 “ the good symptoms appear ever so determinate; for  
 “ it is safest to persist in caution and care a long time  
 “ after the patient is recovered for fear of a relapse<sup>g</sup>.”  
 At the same time we see from hence, why physicians always endeavour to allay the troublesome cough in phthical patients.

4. When the pus effused into the cravity of the chest floats about the lungs on every side, they consume entirely, and no hope is left; as was shewn before in the chapter of the Empyema, and in the preceding paragraph.

5. It is certain, that, in all disorders of the breast, the matter spit out deserves to be attentively considered: for the excretions come directly from the lungs, a vital viscus; and they are derived from the blood of the whole body, which all passes through the lungs.

Hence

<sup>c</sup> Quæ potest tussientibus esse sanationis spes? Non igitur quod in perpetuo, propter respirationem, motu viscus id sit, desperata curatio est, velut qui ante nos medici senserunt, sed propter saniei et puris evacuationem. Ideoque, si statim quis sit aggressus, ac jam dicta ratione necdeatur, coeunt: sin phlegmone prius occuparit, difficilem incertamque curationem recipiant; nam pus et sanies prorsus totaque ex sp. tuss. pulmonum non expelluntur, et tussis affectas partes lacerat valde. *Met. Med. lib. v. cap. 8. Charter. Tom. X. p. 116.*

<sup>f</sup> Lib. viii. cap. 67. p. 88. in Græca editione, p. 174, versæ.

<sup>g</sup> Tabid. Theatr. p. 121.

Hence the spit is carefully examined by physicians in a pleurisy and in a peripneumony, as it shews the genius and the various changes of the disease. But in a phthisis, when a vomica bursts and pours forth its contents, the matter spit out is to be compared with good pus, and that is best which has most of the same qualities; the more it recedes from these qualities either in colour, smell, taste, or consistence, the worse it is.

We spoke in the preceding paragraph of dense, weighty, fetid, and sweet-tasted spittle, and shewed what prognostics were to be drawn from these various kinds in this disease. One thing only remains to be noted. In an external abscess, which is exposed to sight, we see, if it be pierced, that there comes out pus, sometimes bloody, sometimes like a thin fetid ichor, and quite deprived of the qualities of laudable pus; and this happens chiefly if the abscess has been kept closed too long a time, and the pus has degenerated merely by being pent in too long. Skilful surgeons prevent this depravation of the pus by opening the abscess as soon as it is ripe, and giving a vent to the collected pus. But it is observed, that although the first pus which appears, when such an abscess is broke or pierced, be bad, yet it mends every day, and soon acquires all the qualities of laudable pus. In a vomica of the lungs, which often remains close a long time, the same thing happens to that. Although the pus which first issues from a vomica when it breaks should be of the bad kind, this is not always a fatal symptom; for there are still hopes of a cure, if the quantity be diminished, and the qualities grow better on the following days: Wherefore our text very prudently adds, that the case is desperate, when the last signs mentioned in the preceding paragraph accompany such a bad kind of spittle. Bennet<sup>b</sup>, who has so carefully collected every thing that relates to this disease, says, "If, by the help of art, various coloured  
" matter spit out become of one colour; thick foul  
" matter be made pure; unconcocted, concocted;



“ saltish, insipid; fetid, void of smell; and lastly, if  
 “ it be excreted with less difficulty, this is a sign of  
 “ recovery:” for then the same thing happens in a  
 vomica of the lungs which has burst, as in an external  
 abscess, when the ulcerated place is cleansed and be-  
 gins to be disposed to heal up. It should be however  
 remarked, that surgeons are careful, by plaisters and  
 bandages, to keep the air from coming to an external  
 abscess: whereas this cannot be done with regard to a  
 vomica of the lungs; so that pus, which was good at  
 first, is sooner depraved by being retained, and after-  
 wards is excreted under the form of a bad kind of  
 spit: Whence Bennet had good reason to observe as  
 follows; “ If in the day time good matter be spit up,  
 “ although the colour and other qualities of what was  
 “ spit up by night be bad, the case is not desperate;  
 “ for well concocted white matter being spit up by  
 “ day promises recovery i.”

§. 1208. **W**HEN a vomica is once formed in  
 the lungs, the curative indica-  
 tions are to ripen and break it as soon as pos-  
 sible: which is done by a milk diet, riding on  
 horseback, by warm steams, and by expectora-  
 ting medicines. When it is burst, it is requisite,  
 (1.) To guard the blood against the purulent  
 infection.

(2.) To evacuate the pus as soon as possible,  
 and to cleanse and consolidate the lips of the  
 ulcer.

(3.) To direct such aliments as require but a  
 small force not only to pass through the lungs,  
 but also to be assimilated, yet fit to nourish the  
 body, and not easily convertible into pus.

When we treated of the True Peripneumony, we  
 spoke of the disease sometimes terminating in a sup-  
 puration and consequent vomica of the lungs, which  
 must

must be ripened as soon as possible, that it may speedily burst; concerning which see §. 836. and 857. for the indications and remedies are the same. The only difference to be observed is, that for the most part a vomica of the lungs which follows a peripneumony is of a larger size, and when it breaks discharges a large quantity of matter all at once: but those which are formed after an hæmoptoë are often much smaller, and consequently a less quantity of pus is discharged; for sometimes the lungs are obstructed with many tubercles of this kind, which do not suppurate all at once, but successively, as was said before.

1. Mention was made at §. 406. of the fatal evils which may follow if the pus should be re-absorbed into the blood, and flow with the humours through the vessels. It is true indeed, that these are less to be feared, when the vomica being broken there is a free issue for discharging the pus from the body. Indeed, in external abscesses, although they happen to be very large, and discharge a great quantity of pus after they are opened, there are almost certain hopes however of a cure; but the case is quite different in an ulcer of the lungs: For the blood of the whole body is driven through them from the right ventricle of the heart with a rapid motion, and flows by the ulcerated part: whatever is absorbed by the mouths of the veins on the surface of the ulcer, passes quickly by a short passage to the left ventricle of the heart; and, after that, is carried along with the blood, circulating through the aorta to all the parts of the body; for the pulmonary veins are soon emptied, so that a readier occasion is afforded for re-absorption. From whence the reason is evident, why there is more danger of a purulent infection of the blood from an ulcer in the lungs than any where else. It seems scarcely possible to hinder this re-absorption entirely, but we may try by art to cleanse the blood from what has been thus re-absorbed; and this is soonest done by such remedies as resist the depravation and corruption of the humours, and which we shall mention in the next paragraph.

2. These are the general indications in the cure of  
all

all ulcers, as was mentioned at §. 411. For in order to cure an ulcer, we must reduce it to the condition of a simple wound, before there can be any hopes of consolidating it properly. But it is easy to perceive, that this is more difficult to be effected in an ulcer of the lungs, as we can neither discern with our eyes the successive changes of the ulcer, nor can have access to it with our hands to apply topical remedies which shall act on the ulcerated part only. If, for instance, the face of an external ulcer be foul, and the lips callous, so as to need strong depurating remedies, or even corrosives, we may safely use such applications, and guard the neighbouring parts in such a manner, as that they shall not be injured thereby: but this cannot be done in an ulcer of the lungs, because every thing taken by the mouth must circulate with the blood all over the lungs; and whatever is drawn in in the form of a steam, touches the whole aerial cavity of the lungs, as well the sound as the ulcerated parts. We may know indeed by the matter spit out, as it recedes more or less from the qualities of laudable pus, the condition of the ulcer in some measure: but if the vomica be changed into a fistulous ulcer, which sometimes happens, as appears from the observations of Galen and others, it appears sufficiently how difficult the cure is, as neither the narrow orifice of such a fistula can be dilated, nor the callosity which often exists there can be removed; which however (as we shall see in §. 1210.) must be done, in order to the cleansing and consolidating the ulcer.

3. In the comment on §. 192. *et seq.* the diet was described, which is necessary for wounded persons, for restoring lost substance and consolidating what is separated; and the nourishment was advised to be composed of such things as were mild, so soft as to be digested without difficulty, and yet not apt to grow putrid. At the same time it was observed, that skilful surgeons would easily discover, from the condition of the wound; whether any considerable error had been committed in diet. But in order to consolidate an ulcer of the lungs, we must first bring it to a condition



dition of a recent wound; and therefore the same rules obtain in this case: only a much greater degree of caution is here required; for only such a portion of chyle comes to the other parts of the body as corresponds with the proportion of that part to the rest of the body; but all the chyle comes to the lungs before the action of the arteries has subdued and assimilated it, and while it yet retains many of the qualities of the crude aliment. For this reason the food should be of easy digestion, taken in small quantities at a time, and often, lest the diseased lungs should be overpowered by too large a quantity of chyle flowing in upon them at once. For this reason Hippocrates says, *Much food is not to be given at once to phthysical patients, nor many dishes, and chiefly of food prepared from corn; and his wine should be diluted with water, lest it bring on a fever in a weak body, and by the heat increase the defluxion*<sup>a</sup>. For as soon as chyle, offending by its viscosity, or by its too great quantity, is to pass through the lungs, there is a danger lest it should begin to lodge in the vessels which surround the surface of the ulcer, and should obstruct them; and, lastly, should excite a slight inflammation in the mouths of the vessels which open into the cavity of the ulcer, and so form a slough there, which must be separated by an increased suppuration, and thus the cleansing of the ulcer and the consolidating it afterwards would be impeded. This is manifest in external ulcers, if they be at all considerable: For, upon errors in diet, the bottom of the ulcer begins to grow dry, and to look of a deeper red, and discharges but little pus; but the next day the quantity of pus is increased, and this new suppuration by degrees separates the slough raised by the obstructed and inflamed extremities of the vessels which open into the bottom of the ulcer. I have seen like consequences in phthysical cases, when the patients, disregarding the advice of their physician, exceeded

<sup>a</sup> Tabidis cibaria non multa sunt exhibenda simul, neque obsonia plura, quam cibaria frumentacea: et vino diluto inter cibos utendum, ne calefaciat, et in corpore debili calorem exhibeat, et utraque simul eodem tempore calefaciant, et calore multum fluxionem inducant. *De Locis in Homine*, cap. 8. *Charter. Tom. VIII. p. 367.*

ceeded in the quantity of their food, or eat such food as was hard of digestion : in a few hours, they began to feel an oppression ; the hectic heat increased ; the spitting diminished, nay, was sometimes entirely suppressed : afterwards, these bad symptoms gradually decreased ; and the spitting returned, but in greater quantity than before. From whence we understand why Hippocrates, in the place just cited, says, That heat brings on a greater defluxion.

Hence also we see the reason why we are told in our text, that such food should be given as is most proper to nourish the body, and not easily convertible into pus. By this is not meant that the forming of pus should be hindered, as it is well known that under good pus the bottom of the ulcer is cleansed and disposed to consolidate ; and that in a healthy man, who uses a good diet and regimen, pus will be formed in a wound. All that is meant here is, that we should take care that the food do not, by an excess in quantity, or some unsuitable quality, produce new obstructions, and increase the suppuration.

At the same time it is evident how imprudent it is, in order to cure the emaciation of phthysical patients, to give them glutinous food, with the hope that such aliment will stay longer in the body, and adhere more firmly to the parts. Bennet has well remarked the hurtfulness of such food: “ And although (says he) “ the feet of animals, and jellies made therefrom, are “ advised by some physicians ; yet as the blood-vessels in the neighbourhood of the breast are obstructed, and the small vessels which moisten the habit “ being stuffed up throw the blood on the pulmonary “ artery and vein (as frequently happens to persons “ of a sedentary life), such viscid and glutinous food “ is to be forbidden in the whole course of this disease <sup>b</sup>.

§. 1209. **T**HE *first* indication is answered by medicines that are in a moderate de-

degree acid and saline, by vulnerary plants, and by mild balsamics, given in every form; and in large quantities.

To answer the *first* indication, *viz.* the guarding the blood from being infected by the pus, three things are chiefly to be considered. First, that the pus should not remain long in the vomica, so that less occasion may be given for a re-absorption thereof; and this end is to be effected, by promoting expectoration, and using mild detergents for the ulcer. Secondly, that whatever pus is absorbed should be purged off and expelled from the blood as soon as possible, lest being retained it do farther damage: and this expulsion may be obtained by the usual excretory channels of the body; that is to say, the intestines, the kidneys, and the pores of the skin; by which three ways those things are discharged naturally, which could not remain longer in the body without injury to health. Thirdly, such remedies are proper, as efficaciously oppose that corruption of the humours, which is the consequence of the pus being re-absorbed into the blood.

I. In endeavouring to answer the first intention by expectorating and detergent remedies, the physician must do nothing which may impede the healing of the ulcer in the lungs. Now it is known, that if a surgeon was continually to deterge an external ulcer, it would never heal; for good pus ought to be left in the ulcer some time, that under it there may be made a separation of the diseased part from the sound, and that what is lost and wasted may grow again. Nay, good pus will not be formed, unless the humours effused from the mouths of the vessels remain a considerable time in the ulcer. The same things obtain in an ulcer of the lungs; wherefore we are not constantly to promote expectoration, because too frequent a cough exasperates the ulcerated place, and hinders the forming of laudable pus. For this reason it is adviseable for the physician, in the cure of this disease, to allay the troublesome cough, and to use anodynes, that at least



least at night the lungs may have some rest; and then it is observed, that in the morning good and well concocted pus is spit up with ease and to the relief of the patient: and during the time that the cough does not agitate the lungs, there are hopes, that under the good pus the consolidation of the ulcer may begin; so that if the cure proceeds happily, the quantity of pus gradually decreases, without that anxiety which usually attends pus long retained in the lungs. Bennet gives good advice when he says, “ In the day-time, “ when the critical spitting comes on, expectoration “ is to be promoted by lenient medicines only, because then nature co-operates with us <sup>a</sup>.” He likewise advises for the same intention, “ to keep the “ extreme parts warm, especially the feet, and to “ promote their sweating an hour every morning;” for by that means there will be a free circulation of the humours, and nothing repelled to the internal parts which might oppress the lungs.

At the same time such remedies are necessary, which gently deterge the ulcerated parts. Forms of this kind are given in the *Materia Medica* under the present aphorism, from which may be selected such as are most suitable to the condition of the patient. If the pus be viscid and tough, and the expectoration difficult, the mixture composed of oxymel simplex, vitriolated tartar, and syrup of the five opening roots, &c. will be of service. If there be a dryness of the fauces, and a hoarseness, infusions may be made of maiden-hair, scabious, colts-foot, nettles, &c. which may be sweetened with honey, and drank warm often in a day. If a tough viscid mucus oppresses the lungs, smallage, germander, hyssop, and other such like attenuants may be directed: nor is the warm aromatic power of these plants to be feared, as they are first steeped in a large quantity of water; nor will it be amiss to add a third part of milk to these infusions. By these means the blood is supplied with a proper vehicle for urine and sweat, and the absorbed pus happily expelled by these outlets. But these infusions should

<sup>a</sup> Tabid. Theatr. p. 121.

should be drank in pretty large quantities by day, not by night, that the patient may not be disturbed of his rest.

As balsams are very efficacious in curing external ulcers, physicians have recommended their use in the cure of ulcers of the lungs also. It is true, they cannot there be topically applied, but nevertheless, being taken into the stomach, they soon diffuse their fragrance over the whole body; and as all the fluids thereof must pass through the lungs, the powers of these remedies reach the part affected: thus we see, that soon after taking turpentine the urine emits an agreeable smell like that of violets; and the same thing is observed, even if the body be anointed with turpentine. Good physicians prefer native balsams, such as turpentine, balsam of Mecca, balsam copaiva, and balsam of Peru, to artificial ones, so much commended by chymists; those for instance which are called *balsams of sulphur*, which are prepared from sulphur dissolved in expressed or distilled oils, and vended as a certain remedy for a phthisis pulmonalis. Boerhaave, speaking of the artificial balsams, says, that they “are  
“ hurtful to weak lungs, to the stomach and viscera;  
“ that they spoil the appetite, increase the thirst, and  
“ burn up the emaciated body, already deprived of its  
“ moisture by the phthisis itself<sup>b</sup>,” &c. And Bennet abstained from the use of them; who likewise gives this important caution, “that among the ex-  
“ pectorating detergent remedies, we have found those  
“ most serviceable which are prepared from the fir,  
“ pine, and turpentine tree. Acrid and stimulating  
“ medicines should be given only in torpid constitu-  
“ tions, in which the humours are liable to stagnate  
“ and form obstructions; and should be used only at  
“ intervals: for except some such intervals in which  
“ these acrid stimulating medicines may be of service,  
“ we should make use of those first mentioned thro’  
“ the whole course of the disease<sup>c</sup>.” But as the native balsams themselves have a warm aromatic quality, they should be given in a small dose, and frequently repeat-

<sup>b</sup> Chem. Tom. II. p. 430.

<sup>c</sup> Tabid. Theatr. p. 121.

ed, as they are directed in the formulæ given by our author in his *Materia Medica*.

2. The second intention to be answered, for the indication of guarding the blood against the purulent taint, was, That whatever pus had been re-absorbed into the blood should be expelled from thence as soon as possible; as also whatever fluids were so altered by this taint, as to degenerate from the qualities of health: for in order to the healing of the ulcer, it is necessary that bland healthy humours should flow thro' the vessels. Hence, at the same time, it appears of course, that every other kind of acrimony of the humours, whether it existed before the disease, or was produced during the disease, should be corrected or purged off from the body. Before, at §. 1198. it was amply shewn, that this disease frequently took its rise from an acrimony of the humours; and it is easy to comprehend, that so difficult a disease can never be removed, unless the cause which first produced it can be corrected.

Besides those remedies, which, by sheathing, are capable of weakening any acrimony, or of destroying it by an opposite quality, physicians have endeavoured to expel it by those channels by which nature discharges acrid particles from the body, and for this end to increase the natural secretions and excretions.

The principal of these channels, as has been said before, are three; the pores, the kidneys, and the intestines. But as the urine, even in healthy people, contains the salts and the more oily acrid parts of the blood, it has been universally allowed, that its secretion and excretion may safely be augmented in order to lessen the acrimony of the blood and other humours. Certainly, all those infusions of vulnerary herbs which have been mentioned, increase the quantity of urine, as they supply the blood with plenty of water, which has the first rank among diuretics<sup>d</sup>. Native balsams have the same efficacy: the violet smell so immediately communicated from them to the urine, sufficiently shews, that a diuretic quality is just-ly

<sup>d</sup> H. Boerh. *Instit. Medic.* sect. 1122.



ly ascribed to them. But physicians are more cautious with regard to evacuations by sweat and stool; for it is observed, that when death is coming on in a consumption, the unhappy patients are dissolved into sweats, and exhausted by them: whence large nocturnal sweats (§. 1206.) are enumerated among the bad symptoms; and it was noted under the same head that a diarrhœa with yellow stools, and which had a putrid cadaverous stench, generally put an end to the disease and life together. On this account, many have feared, lest by exciting sweats, or by purging, they should hasten death. And certainly no wise man will attempt either of these things, when the fluids, dissolved by a putrid taint, issue at the pores with the first sleep: or when the blood, being dissolved to a corrupt thin fluid, is expelled by the meseraic vessels into the cavity of the intestines, and produces a most fetid diarrhœa; for then the disease is beyond the power of art. But in the beginning of the disease, before the strength is quite gone, and the body totally exhausted, these methods have been tried by physicians not unsuccessfully, but always cautiously, and with strict attention whether the patient was relieved by them or not.

It was before mentioned, that Bennet was very solicitous that the perspiration should be kept up at the time that he endeavoured to promote expectoration; and advised, that the feet particularly should be kept in a sweat. He recommended thick clothes, “lest, by the accession of cold air, the blood should be driven inward, which might endanger a return of the hæmorrhage.” And he advises, that instead of linen, the patient should wear flannel shirts, which more readily imbibe what exhales from the skin, and do not give a sensation of cold as linen does, when moist with sweat; for, from this sensation of cold, the pores suddenly contract, and the perspiration is entirely stopped, not always without bad consequences.

Nor is this all. The same author <sup>f</sup> tells us, that he had learned by experience that sudorifics are of great

service in the first stage of a consumption. He had observed, that spontaneous sweats sometimes break out on the chest in the sleep. In this case, he advises to promote a sweat all over the body; and asserts, that such sweats are particularly serviceable to phthical people of a cold constitution. He particularly commends such sweats as are brought on in the morning, and without trouble to the patient. At the same time he well remarks, that sudorifics are hurtful in consumptions of long standing, “as they remove the materia morbi in part only, and hasten the attack of the hectic fever.” He adds, “that frequent sweatings are of service to those who are subject to heat, scurfs, or itchings, on the skin in autumn or winter.” At the same time he was very careful to observe, whether the sweats were of service or not; for if the cough abated, and the appetite increased, they were to be promoted: And he commends these sweats for this reason, because acrid particles are evacuated by this means from the blood; for he advises that they should be repeated, “if they vellicate the lips or membrane of the tongue, as they transude. But when this kind of salt ceases to be secreted from the blood, we must leave them off by degrees.” He even conceived so great hopes from exciting copious sweats, that if neither pus, nor blood, nor saliva with a fetid smell like rotten eggs, were excreted any longer, he promises a cure, although the cough should still continue violent; which, says he, uses to give way gradually by persisting in the same method.

But it is apparent, that the hotter sudorifics are not to be used here, but such as are gently aromatic, and even these should be infused in a large quantity of water. There is a list of these in our author's Institutes<sup>§</sup>; and in the Materia Medica, we find a decoction of the three sanderwoods, saffiafras, &c. two ounces of which are to be taken warm every two hours in the day-time, in the evening on going to bed four ounces, and early in the morning the same quantity.

tity. By this method a gentle equable sweat is usually procured, by which the acrid particles are separated from the blood, and a mild diluting vehicle afforded to the body.

It was remarked before, at §. 1198, n<sup>o</sup> 1. that Ben-net had seen some patients almost wasted away, whose whole system of blood was impregnated with salt; and in a man who had eat too great quantities of common salt, “the sweat, which broke forth spontaneously, was extremely salt; and that which dropt about the nose, if not wiped off, formed into crystals, visible to the eye, and friable by the fingers<sup>h</sup>.”

From hence it appears, that some service may be expected from exciting sweats, with proper caution, in a beginning consumption. Marcellus Donatus relates some cases, in which a decoction of guaiacum cured a phthisis, not merely beginning, but which had been of some standing. Among the rest is a remarkable case of a woman who was cured by Philip Ingrassias. “After a copious hæmoptœ, she had fallen into a consumption; and for several months afterwards not only grew thin, but spit forth fetid pus; and that, at intervals of not more than a fortnight, she spit out the pus collected from thence not less than four pints, and sometimes more: when this woman had taken decoction of *lignum sanctum* for a month, she was so well recovered, that ten years after, when Ingrassias wrote this account, she was alive, and never had a relapse.” Now it is well known, and we shall particularly observe hereafter when we treat of the *Lues Venerea*, that guaiacum wood very efficaciously promotes sweating, and that obstinate ulcers are cured by it; as also that it is very efficacious in curing the diseases of the bones, as was said before.

Physicians also have sometimes attempted to evacuate the morbid matter by stool, but with great caution, and only in those “whose muscles were hard,

<sup>h</sup> Tronchin de colica Pictonum, p. 101.  
Mirab. lib. iii. cap. 10. p. 184.

i De Medic. Histor.



“ and their pores shut up:” but in the beginning of the the disease, as Bennet <sup>k</sup> says; for in the height he advises to abstain from purges, and to use only gentle openers, which he calls *minoratives*, with which he advises that cordials and antiseptics should be combined: at the same time he says, “ that even these are not to  
 “ be repeated frequently, unless a mucous viscosity,  
 “ or a saltish water, being mixed in large quantities  
 “ with the excrements, should induce us to alter our  
 “ practice.” For this seems to have been his principal aim, that he might draw off the viscid pituitous saburra, or acrid matter, by stools, lest the ulcerated lungs might be further injured by them. For elsewhere he has said, “ If a consumptive person discharges plentifully, by stools, a pituitous slime, or a  
 “ brackish fordes, this relieves the breast greatly, and  
 “ gives no small hopes of recovery <sup>l</sup>.” Nay, this excellent writer seems more to commend purges in the beginning of the disease, when there is in the bowels this pituitous slimy saburra, than when some acrimony prevails; for he rather endeavours to expel that by sweats: this appears from the following words;  
 “ When there is a defluxion of saltish humours upon  
 “ the head, we should not purge, lest they be transferred to the breast; but in this case we find it is  
 “ most serviceable to promote sweats <sup>m</sup>.”

On the same account he seems to prescribe gentle cathartics, to persons inclined to catarrhs, both in spring and winter, but as preventatives before the catarrhs come on; for he adds, “ When we are endeavouring to promote an anacatharsis, we must omit  
 “ *minoratives* <sup>n</sup>.”

Hippocrates <sup>o</sup> likewise appears sometimes to have given purges in consumptions, but with caution also.

Bennet <sup>p</sup> experienced, that gentle purges were then most useful in the beginning of a consumption, “ when  
 “ the patients just before break of day, and being  
 “ half asleep and half awake, had a stool.” In his  
 cure

<sup>k</sup> Tabid. Theatr. p. 118, 119, 120.  
<sup>p</sup> 119.  
 Charter. Tom. VII. p. 569, 570.

<sup>l</sup> Ibid. p. 112.      <sup>m</sup> Ibid.  
<sup>o</sup> De Morb. lib. ii. cap. 17, 18.  
<sup>p</sup> Tabid. Theatr. p. 118.

cure, he gave physic about bed-time, so as to procure two or three stools in the morning, from whence none, or a very small loss of strength followed; for at the same time, when the effect of the physic was over, the discharge of the pus by spitting was not stopped in the day-time.

3. The third thing to be effected in order to guard the blood against the putrid taint, was, that such remedies should be used as most efficaciously resist that vitiation of the humours consequent on the resorption of the pus into the blood.

It was shewn before, §. 406. that the very best pus is liable to grow putrid by long stay: wherefore also, in an ulcer of the lungs, the pus retained there too long, or re-absorbed into the blood, tends to putrefaction; and the appearances which are observed in a consumption confirm this. It was said also, that sometimes the matter spit out had a very offensive smell. Hippocrates<sup>a</sup> remarked, that the patients, when about to spit, found the taste of the saliva in their mouth abominable; and that if it fell on burning coals, it had a grievous fetid smell: that the pus sometimes grows putrid about the heart: that sometimes pus is spit up, which is like hailstones; and being rubbed in the fingers, feels hard, and smells fetid; and that there is a fetid smell in the mouth like raw fish. Elsewhere<sup>r</sup> he says, the pituita grows putrid in the head, and flows down to the lungs; and that this viscus is irritated by salt phlegm, and there comes on a vehement thirst. If, besides this, we reflect, that the colliquative sweats in the last stage of a consumption have a most exceeding bad smell, and that a most putrid diarrhoea comes on towards the end, which is presently followed by death, it is evident, that there is an universal tendency to putridity in this disease; and that therefore such remedies are requisite in this distemper, as most efficaciously resist putrefaction, and thus may prevent it while it is feared, or correct it actually existing. In the mean time, we are to attend to the ulcer, and take care that we do not  
use

<sup>a</sup> Loco modo citato.

<sup>r</sup> De Intern. Affect. cap. 2. ibid. p. 645.

use such acrid antiseptics as may exasperate it. Those native balsams which have been already mentioned, besides an aromatic fragrance, have also an acid, which is contrary to putridity; as the chemical analysis of them demonstrates. Physicians frequently give myrrh to consumptive persons, as appears from the formulæ in the *Materia Medica* under this head. Now from the admirable experiments of Dr Pringle <sup>f</sup>, it appears, that myrrh is a powerful antiseptic, far exceeding sea-salt in this quality. We are indebted to this gentleman for many excellent observations, tending to elucidate the effects of the remedies generally prescribed by physicians in this disease. As chemists had taught us that putrefaction produces a volatile alkali, there was a fear that the disposition to putridity should be increased by such things as contained this alkali; nevertheless, physicians had observed, that lobsters boiled and soaked in their own broth were very good nourishment for consumptive persons. Now it is known, that lobsters have a kind of urinous smell, not unlike a volatile alkali: hence, many feared danger from them; and sauced this food with vinegar or lemon juice, to obviate putridity. But Pringle <sup>g</sup> has demonstrated, that alkaline salts prevent putrefaction, even more powerfully than sea-salt. He likewise found that fixed alkalis had the like qualities. For this reason, the Seltzer waters, which contain a fixed alkaline salt, are safely and advantageously given to consumptive people, especially if mixed with a third part, or even an equal proportion of milk. Avicenna <sup>h</sup> advises the eating of sugar of roses in great quantities every day, even with bread; and gives us the case of a consumptive woman who was cured by this remedy. He also extols troches of camphire. How perfectly does all this agree with Dr Pringle's observations <sup>i</sup>: He has discovered a powerful antiseptic quality in sugar, and thinks that it is owing to the present great use of it that putrid fevers are less frequent than  
for-

<sup>f</sup> Observations on the Diseases of the Army, p. 377.  
p. 372. <sup>h</sup> Canon. Medic. lib. iii. Fen. 10. Tract. 5. cap. 6. p. 668.  
Observations on the Diseases of the Army, p. 393, 394.

<sup>g</sup> Ibid.



formerly; and as to camphire, he says, that two grains of it were more effectual in preventing putrefaction than sixty grains of sea-salt <sup>w</sup>. He likewise found a powerful antiseptic quality in the Peruvian bark <sup>x</sup>. Morton gave the bark in this disease. Torti <sup>y</sup> owns, that he gave the bark to several phthifical persons not yet quite worn out with the disease, both to comply with their request, and to stop the too frequent returns of the fever. He always found indeed, that it procured a sensible relief for some days; and sometimes, though not always, with a manifest interruption of the accustomed exacerbations: but the disease got head again soon, and pursued its usual course to death. Yet he believes, that it was this remedy which preserved a phthifical lady of quality, who was pregnant, so long as that she was safely delivered of a child. He says, however, elsewhere <sup>z</sup>, that he had seen a boy whom he thought consumptive, and who was esteemed so by every one, and who besides was afflicted with a spina ventosa; when, at the urgent request of the boy's father, he reluctantly gave him the bark, expecting no good from it: but afterwards he saw him walking about the city, so fleshy, strong, and ruddy, that he scarce knew him again, and quite free both from the consumption, and from all remains of the spina ventosa. He relates other instances of consumptive persons restored to health by the bark. He does not indeed deny, that in some cases it was unsuccessful, but however did no harm. It is to be remarked, that this worthy physician gave it reluctantly, not expecting it would do any good, and therefore was the more amazed at its success.

I have myself tried the use of the bark in the beginning of a consumption, and have not repented of the trial. I gave the bark under various forms, and for a long time, to a lady of very high birth, who, by a vexatious cough, and a slow fever, was emaciated, without an hæmoptoe having preceded: and although her strength was pretty much sunk, and she spit pus,  
and

<sup>w</sup> Ibid. p. 373.<sup>x</sup> Ibid. p. 379.<sup>y</sup> Lib. v. cap. 2.

p. 449, 450.

<sup>z</sup> Lib. v. cap. 5. p. 492.

and had a vitious conformation of the chest, yet she perfectly recovered.

Thus we see, that many physicians used such things both in diet and remedies as had an antiseptic virtue, although perhaps they were not aware of these. Cardanus<sup>a</sup> relates, that he cured a young girl, whose father died of the same disease, labouring under a consumption of the worst kind; and that so vehemently, that he gave her over; for she had a violent fever, a difficulty of breathing, a great cough, and a plentiful spitting of pus. He ordered, that she should live entirely on ptisan and water sweetened with sugar; and should every morning take four ounces of decoction of tails and claws of crabs in barley-water, with two drachms of sugar: and she perfectly recovered. He saw many others cured by the like means, and particularly by the constant use of sugar of roses<sup>b</sup>.

A youth, from drunkenness and excess in venery, had got a perpetual violent cough; he spit a great quantity of matter of various colours; he had a straitness and oppression of the breast, and a fever, and was emaciated almost to a skeleton; his strength also was greatly decayed. Various remedies were used in vain, and every one despaired of his recovery. He longed very much for garden strawberries: the physicians gave leave that he should have them; and in three weeks time, after he had eat five ducats worth of this fruit, he was so much altered in all respects for the better that there were very good hopes of his recovery, and in two months time he grew well<sup>c</sup>. He probably eat also a good quantity of sugar, as this is generally strewed over these fruits.

Small-beer without hops, milk-whey acidulated with the juice of wood-forrel, China-oranges, pine-apples, &c. were directed by Bennet<sup>d</sup> as a constant drink to phthysical persons. Patients who have spit a fetid purulent matter have been cured by drinking mineral waters, which, besides steel, contained alum also<sup>e</sup>. Now  
Dr

<sup>a</sup> De Curat. Admir. Curat. 8. Oper. Tom. VII. p. 254.      <sup>b</sup> Ibid. Curat. 10. p. 255.      <sup>c</sup> Hoffm. Medic. Ration. et System Tom. IV. parte 4. p. 330.      <sup>d</sup> Tabid. Theatr. p. 150,—152.      <sup>e</sup> Essays and Observations, physical and literary, Vol. I. p. 364.

Dr Pringle <sup>f</sup> has demonstrated that alum possesses a more antiseptic quality than other salts. Perhaps we might here refer to a case related by Tulp<sup>g</sup>, of a woman, who, by neglecting bleeding, having become suppurative, spit such filthy matter, and so much of it, as to fill a large basin, and infect an ample room with the stench; and this unhappy woman was as emaciated and decayed as in the last stage of a consumption: Having laboured under this disease above four months, she began to long for raw oysters, which she eat greedily, with so good an effect, that all the symptoms presently abated, and she soon perfectly recovered. Now oysters have a very pleasant saltish liquor. Hippocrates <sup>h</sup> advised salt meats for promoting a spitting in purulent cases. It cannot however be denied, that Dr Pringle's <sup>i</sup> experiments prove, that a small quantity of sea-salt rather accelerates than impedes putrefaction; and hence, perhaps, it is a necessary sauce to our food, to make it more readily dissolve in the body. But a brine made of sea salt preserves the flesh of animals from putrefying, as is well known. Certainly it would scarcely appear safe, to throw in sea-salt in such quantities into the body as would be sufficient for making it act as an antiseptic; especially as in the cure of an hæmoptoë every thing acrid and salt is to be avoided, lest the disorder should return. It is however true, that a spitting of blood is less to be apprehended when an ulcer is already formed in the lungs; for by our former observations it appears that the lungs may be entirely consumed by a purulent phthisis, although the hæmoptoë do not return. Hence also we comprehend, how a putrid scurvy may be caused by eating salted food, as it often happens in long sea-voyages; which was not so clearly apprehended before Dr Pringle made his experiments. We have certainly milder remedies, which possess a very efficacious antiseptic virtue, and therefore may very well do without sea-salt.

It

<sup>f</sup> Observations on the Diseases of the Army, p. 376.<sup>g</sup> Lib. ii.cap. 8. <sup>h</sup> De Locis in Homine, cap. 8. Charter. Tom. VII, p. 367.<sup>i</sup> Observations on the Diseases of the Army, p. 391, 392.



It also is manifest, that in a phthifis pulmonalis it is of the greatest importance that the blood should be preserved free from a putrid taint, and yet that physicians have not always been sufficiently attentive to this.

§. 1210. **T**HE *second* indication is answered, By expelling the matter, by vulnerary infusions; by diuretics; by medicines, both internal and external, which excite a cough; by exercise, riding, and the country air: then, By cleansing the ulcer by the internal and external use of balsamic detergents; and lastly, By healing it with consolidating paretics.

No ulcer can be healed, as was said before, till it be reduced to the state of a simple wound, that it may be closed up. Wherefore the pus must be discharged, and the cavity in which it was lodged be cleansed; which is to be done by a gentle and moderate suppuration, as we see in external ulcers; then the place thus cleansed must be closed up. We readily see, that every thing which has been recommended in the preceding paragraph is of use also to answer this indication; for infusions of vulnerary herbs, plentifully drank, absterge the ulcerated place, and at the same time wash away from the blood such pus as may have been absorbed into it; and particularly carry it off by urine, as the infusions are in water, and most vulneraries have a diuretic quality. Certainly Galen saw an abscess of the lungs purged off by urine, as was mentioned on another occasion, §. 406. And a remarkable case is related<sup>a</sup> of a patient afflicted with an ulcer of the lungs, whose spitting was suppressed by injudicious treatment, and who had such very bad symptoms as that death seemed at hand: by the advice of a skilful physician, he drank, for eight days, asses milk boiled: the effect of which was, that although the spitting was still suppressed, the disease did not grow worse. On the ninth day came on a great pain in the loins, and

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<sup>a</sup> Gio. Michele Gallo dell' uso del latte, Tom. II. p. 93.

a troublesome strangury; and afterwards he discharged purulent fetid urine for a week: the breast was relieved, the fever ceased, and he grew perfectly well. Yet the pus collected in the ulcer of the lungs could not have been evacuated by urine, unless it had first been re-absorbed into the blood in great quantities; which certainly is never without danger, although it is sometimes happily expelled from the body by urine or stools.

The evacuation of pus by spitting is far more safe; but this can scarce be effected without a cough. Hence, such remedies as excite a cough, are advised to this end; for a cough clears the lungs. At the same time, if it be violent, it exasperates the ulcer. Such remedies therefore are to be given, as render the pus easy to be discharged, and yet do not hurt by their stimulus. A decoction of this kind is given in the *Materia Medica*. But when the pus is ripe, and of a laudable kind, it is easily brought up by coughing, and without any trouble almost; which chiefly happens in the morning, after good sleep; for then the lungs have been quiet a long time, and agitated only by the gentle motion of breathing; and thus the healing of the ulcer is begun under good pus. But the same expectorating medicines are not alike good in all cases. Bennet gives good advice when he says, “Sharp and stimulating medicines are to be given in sluggish constitutions,—and then only at such intervals as require them<sup>b</sup>.” Thus, if the spit be naturally tough, or if a viscid mucus be excreted with pus, and with difficulty, then an infusion of hyssop with oxymel simplex or oxymel sciliticum will be of service; or if these be thought improper, milder infusions of vulnerary herbs may suffice. All these infusions being drank, are mixed with the blood, and are carried to the ulcerated place. Hence physicians have thought of external remedies for this purpose also. Plaisters, or ointments, applied externally to the breast, can be of little use, although physicians have sometimes directed these, when the patient has confided in appli-

cations of this kind: nor can any remedies come in contact with the ulcer, unless in the form of a steam; as even a single drop of water falling into the lungs is immediately rejected by a cough. We read in Hippocrates as follows: *But when the matter spit out is fetid, on the intermediate days, between the use of the decoction of lentiles, infuse a medicine into the lungs; and after a day more past, use fumigations* <sup>c</sup>. But it is certain, that steams and vapours drawn in with the air in respiration may be of use, as they every where come in contact with the whole aërial cavity of the lungs; and thus various remedies may be applied, according to the various condition of the ulcer. Bennet says, “Vapours and fumigations are very noble remedies, and our sole confidence in extreme danger, &c. For the lungs growing too dry and tense, are softened by the moisture of one kind of applications; or dried and hardened, when too moist and relaxed, by the dry fumigations; and, when obstructed with putrid or viscid matter, are cleared from it: and by the combination of both kinds, foul ulcers are deterged, and also the force and quantity of new matter flowing to the part are abated; the nature of the vapours applied, being always adapted to the end intended to be answered.” He then relates many cases which prove the happy effects of this method: and afterwards <sup>e</sup>, he describes the instruments by which this watery steam may commodiously be so applied, that they may arrive safely to the air-vessels of the lungs. At the same time he has various formulæ of remedies <sup>f</sup>, to answer the different indications of softening, absterging, drying, and consolidating. Perhaps, it may seem surprising, that he should use orpiment reduced into troches, with the white of an egg, for a fumigation, as it has been described by the ancients under

<sup>c</sup> Quum autem sputum graveolens fuerit, intermediis inter lenticulæ decoctum diebus, medicamentum in pulmones infundere, intermissio vero uno die, suffumigia adhibere (Συμμία). *De Morbis, lib. ii. cap. 18. Charter. Tom. VII. p. 570.*

<sup>d</sup> Tabid. Theatr. p. 76.

<sup>e</sup> Ibid. p. 168.

<sup>f</sup> Ibid. p. 165.



der the name of arsenic. But what we now call arsenic was unknown to the ancients: orpiment in many of its qualities resembles sulphur; and is improperly called yellow arsenic, as it is harmless enough<sup>g</sup>. Air replete with sulphureous vapours, is recommended as very useful by physicians, and very beneficial in phthical cases; and therefore they send their patients to mount Tabio, in particular, near Naples<sup>h</sup>. Thus Galen<sup>i</sup> also, in his time, sent consumptive persons to Tabias, near Vesuvius, to eat milk there, and constantly breathe an air of this nature. Bennet attempted to make such an air by art. He says, “Of whatever kind the steams and fumigations shall be, let them be received entire, and instead of air itself, into the organs of respiration, in a closet or chamber, with the windows shut, that all breath of colder air may be excluded; and let the patient stay there a long time, else these applications will be used in vain<sup>k</sup>.” At the same time he observes, that the first fumigations give uneasiness to the lungs, but that afterwards they bear them with great ease. It was said before, at §. 1200. that Dr Mead, in his *Monita et Præcepta Medica*<sup>l</sup>, recommends fumigations of frankincense, storax, &c. although he knew that this remedy was scarce ever used, and neglected as unprofitable by most. I have tried this method in a vomica, and gained my end, for it broke sooner than it otherwise would have done. I contrived a steam of hot water to be constantly conveyed through a pipe, near the patient’s bed; and when I found he that could bear it well, directed it still nearer to him: and I also ordered fumigations with frankincense, storax, amber, and benjamin, so that the air of the room might be impregnated with them, increasing the quantity gradually; for, without this caution, a violent cough ensues, which might do great harm. Patients bear the smoke of frankincense and storax easily enough, but amber is more irritating, and melts by the

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fire

<sup>g</sup> H. Boerh. Chem. Tom. I. p. 47. et Fred. Hoffm. Observ. Physl. Chem. p. 259, et seq.

<sup>h</sup> Fromond Risposta Apolog. p. 438.

<sup>i</sup> Meth. Med. lib. v. cap. 12. Charter. Tom. X. p. 122, 123. <sup>k</sup> Tab. bid. Theatr. p. 125.

<sup>l</sup> P. 51.

fire into a pretty hot oil, and a volatile acid salt. Benjamin, although its odour be fragrant, should be sparingly used; because it has an acrid steam, which, when received on a paper cover, is condensed into little masses of a snowy colour, which are sold in the shops under the title of flowers of benjamin; and have so warm a quality, as when put on the tongue to excite a sensation like burning. I have used the steam of benjamin, that the vomica first mollified by watery steams, might be broke by a sudden and violent cough.

We are however to observe, that it is not every remedy whose virtues will ascend in exhalations, and under that form be applied to the lungs. The efficacy of emollient herbs stays behind in the decoction, and the steam arising from thence is mere water, which however gives a very good emollient and moistening steam. Physicians, however, often prescribe these things; and rightly, lest otherwise the simplicity of the remedy, if it consisted only of water, should make the patient and his friends despise it; although they very well know, that nothing ascends to the lungs from these decoctions but water rarefied to vapour. But they are mistaken, who, in order to make the lacerated vessel in the lungs contract itself, order the patient to draw in the steam of a decoction of astringent remedies; for the steam of the hot water itself relaxes, and the astringent qualities are fixed and do not ascend with the water.

Moderate exercise, such as the patient can bear, is of great service; for muscular motion accelerates the return of the venous blood to the heart, which consequently will be more frequently contracted, and a greater quantity of blood driven with a greater velocity through the lungs, by which means the purulent matter will sooner be rubbed off and expectorated; especially in the morning, when a quantity of digested pus has been accumulating during sleep. At the same time respiration will be brisker, and the air being more frequently drawn in and breathed out of the lungs will perform the office of an excellent deterfive remedy,

dy, more especially if it be the pure air of a healthy country place. But it is very evident that caution is required here; for not only the cleansing of the ulcer, but the healing it also, is necessary; and if an external ulcer was constantly wiped, it could never be healed. Bennet very prudently warns us of this, ordering great care with regard to motion of the body by day, and that all the exercises should be light, especially “for patients of a warm temperament and slender frame m.” He advises also to exercise principally the lower parts of the body, and vehemently condemns all violent motions of the upper parts. “But (says he) where the chest, and the parts appertaining thereto, are of a lax habit and cold temperament, brisker motions, and such as may more dilate the muscles of the breast, are sometimes to be ordered, such as shooting with a bow or darting a spear.” But such motions seem rather proper for corroborating the general habit, and the breast in particular, than for curing an ulcer of the lungs. On another occasion, §. 1200, n<sup>o</sup> 4. it was remarked, that it afforded a very favourable prognostic, if, from the use of remedies, or travelling, the too strait chest became opener, and the strength increased; and that, on the contrary, a strait compressed chest was held a bad preface, as we said §. 1198. It is certain, that the strength and fulness of the muscles is increased in those parts of the body which are more moved than the others. They who frequently speak in public, have the muscles of the face almost always larger; and how vast are the sinews of the arms and shoulders of those brawny artificers, who labour in beating out anchors. As most people do almost every thing with their right-hand, and seldom use their left, it most frequently happens that the right-hand is larger and stronger than the left. From whence it appears, that the muscular motion of the arms and hands may be of use for the mending the structure of the chest.

At the same time it is easy to comprehend, that such kind of exercises are only to be recommended to those



who have almost got the better of this disease, and acquired sufficient strength for going through them: and it seems to be more useful and safe to provide such exercise and motion for consumptive persons, as may answer the end, and procure the proposed advantage, without subjecting them to be much fatigued. Riding on horseback is of great efficacy in this as well as in many other chronical diseases. During this exercise, the whole trunk is perpetually agitated, and the air acts with more momentum upon the lungs; for while a person is riding, he almost always feels a wind in his face, although not the least breeze appear to blow, nor a leaf on the trees to move. The excellent Sydenham, with his usual candour, owns that he had cured some of his friends by riding; “when I certainly knew (says he) that neither by giving them the most costly drugs, nor by any other method whatsoever, I could have done them any more service than if I had with so many words exhorted them to be well<sup>n</sup>.” Nor had he seen riding to be of use only in a slight degree of this disease, but even in a case which was next to desperate, when after night-sweats a diarrhœa had already come on, which usually is the harbinger of death. Nay, he affirms riding to be as efficacious in this disease as the bark in agues, or mercury in the lues venerea. At the same time, he cautions the patient to be careful to lie in dry sheets, and to ride far enough. And he adds, “They who are past the acme of life should persist longer in this exercise, than they who have not yet attained thereto.” But in order for a person to ride on horseback, some strength is necessary; and if that be wanting, a carriage may be substituted to the horse: from which last manner of riding, also, Sydenham affirms that he has seen wonderful good effects in the cure of a consumption, although he gives the preference to riding on horseback. I have given the same advice to many, to wit, to ride in carriages, and especially to such whose narrow circumstances did not allow of the expence of a horse. I have known some sailors and fishermen, who, having

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an ulcer in the lungs, became coachmen, &c. and were perfectly cured. Weak patients should begin by riding in a carriage; and as their strength increases, riding on horseback may be advised. But these exercises are of more service in the morning, after a light breakfast; for when the stomach is full, persons do not bear riding so well. It is also prudent to ride softly at first, and a little way; increasing the briskness of the motion, and the length of the ride, gradually. Bad weather must be avoided at first; which, as the strength increases, and the disease abates, is not so much to be minded. Going into the country is also recommended by physicians; not so only that the patients may enjoy a freer and purer air than that of cities; but also that, as their strength increases, free from cares, they with light rustic employments may exercise their bodies and amuse their minds, and make their time less tedious. Is there not perhaps another cause, why living in the country may be of service to consumptive persons? It is known, that when, after dry weather for some days, rain falls and wets the earth, a pleasant smell arises perceptible to every one; and which is commonly ascribed to the plants, which wanting moisture before, and being now refreshed by the rain, exhale their scents more freely and copiously. But Reaumur<sup>o</sup> has observed, that there is a like fragrance to be perceived after rain in fields, where there is nothing but dry stubble left after the harvest: and examining the affair more attentively, he found that dry earth is without smell; but as soon as it is so much moistened as to be of the consistence of soft paste, it exhales a strong odour; if more water be added, this odour abates, or even quite ceases. Nor does it seem easy to exhaust this power which the earth possesses of producing a smell: This author, every day for a fortnight, and several times each day, made cakes of wet earth, then dried it, then moistened it again; nor could he perceive that, after these so often repeated experiments, the earth if moistened again was less fragrant. He observed, moreover, that this fragrance would not spread

spread to any great distance, without being much diminished and soon entirely ceasing. In many parts of the earth, vapours ascend to a small height from its surface which kill animals<sup>p</sup>. It has been further observed, that the said fragrant exhalation ceases, if thunder and storms soon follow upon the rain: while these yet last, the exhalation returns; and after the storm is over for some hours, this fragrance strikes the smell of a person even going upright, and consequently at a considerable distance from the earth. Every one, I believe, must have remarked this at some time or other. Hence the earth, as it seems, when it is moistened to a certain degree, exhales fragrant steams of various kinds in various places, as the difference of the smell shews, but most of them are wholesome; for men, faint with the summer-heats, feel themselves wonderfully refreshed when they scent this fragrance after rain. In some places, these effluvia are perhaps hurtful; and may be the causes of endemial and epidemical disorders, of which we shall speak hereafter.

Perhaps it may appear strange, that I should seem to ascribe any peculiarefficacy for curing the Phthisis to this property of the earth, as these effluvia from the ground, floating in the air, claim rather to be reckoned a wholesome air. But there is another reason: I have formerly heard, from a person most deserving of credit, that, through the whole kingdom of Granada, they have a method of curing a phthisis by an earth bath; and I have since read the same account, in the works of Francisco Solano de Luque<sup>q</sup>, (famous for his discovery of prognosticating the crisis of diseases from the pulse alone). He attests, that he used a bath of earth with success; and, among many other cases, that he cured a hectic, which had been judged incurable, by thrice using a bath of earth. This he performed in the following manner. He caused a pit to be dug in the earth, where no plants had been sown: in this pit he put the patients up to the neck, and then covered them with the same earth which had  
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<sup>p</sup> Ibid. Pan. 1751. <sup>q</sup> Origen Morboſo Capitul. V. p. 174, &c. et Lapis Lydos Apollinis, p. 231.



been dug out, and there left them till they began to shiver: while they remained in this pit, he gave them food, if they wanted any: as soon as they began to shiver, he caused them to be taken out of the pit, and wrapt in linen cloth wetted with rose-water; after two hours, the whole body was rubbed with the unguentum resumptivum of Zacutus Lusitanus. Others have recommended an ointment made with leaves of flowbread and hogs-lard, with which they rubbed the back-bone, and wrapt the whole body round with rollers on which this ointment had been spread. But he observes, that a new pit must be made every time this operation is repeated; and that the use of this kind of bath is only safe from the end of May to October. He philosophises wonderfully on the effects of this bath, and thinks that the earth absorbs into itself the morbid taint, &c. But as the earth is very seldom dried, even by the summer-heats, to such a depth, it is very probable, that the moist earth, which is the most disposed for emitting effluvia, being in contact with the body on every side, perhaps, is of service rather by exhaling a useful fragrance, than by absorbing any noxious miasmata from the diseased body.

We have already spoken of the use of balsamic abstersgents both internal and external.

In perusing the writings of many physicians, that I might learn what had ever been tried for the cure of a consumption, I observed that many placed great hopes in such medicines as have been found efficacious in curing ulcers of the external parts. The remarkable efficacy of decoction of guaiacum in curing ulcers, and rottenness of the bones, is known to every one; and it was shewn in the preceding paragraph, that a phthisis had been cured by the use only of decoction of guaiacum. Of how great service mercury and the various preparations of it are, is equally well known; so that the worst ulcers, and such as resist all other remedies, will yield to this. Helmont<sup>r</sup>, after he has raved, according to custom, against medical schools, adds, “ But if there has been a spitting of blood, and an  
“ ulcer

“ ulcer is already formed, learn to make up those remedies with which Paracelsus cured the consumption. Take, I say, inwardly, all those things which cure a cancer and corroding ulcers; this will cure an ulcer of the lungs: for that which, being drank, cures an ulcer of the leg or foot, why should it not do the same thing on the lungs?” But he recommends the milder sort of these remedies, such as *mercurius diaphoreticus*, sweet as honey, and fixed, *lilii tinctura volatilis*, &c. And elsewhere he says, “ Thus also ulcers of the lungs are healed by *corallatum dulce merc. diaphor.* by the virtues of which, as we find recorded in Paracelsus’s epitaph, he often cured a consumption<sup>s</sup>.” Perhaps something like this might be tried by a prudent physician, but with great caution; and with the gentlest remedies of this kind; and such as do not cause great evacuations, which are always dangerous in weak exhausted bodies; and such as do not suddenly dissolve and break the crasis of the fluids, as a phthisis, when it is near bringing on death, produces a putrid dissolution of the humours. We find that both ancient and modern physicians advise such remedies for a consumption as are useful in curing external ulcers. Some have recommended emulsions made of milk and honey; others, lime-water with milk. Now all surgeons own the usefulness of honey as a detergent in ulcers, and the efficacy of lime-water for drying such ulcers as run too much. When it was found of how much service the bark was, not only in a mortification, but also in a caries of the bones, and in obstinate ulcers, physicians applied it also for the cure of a phthisis. Dr Mead<sup>t</sup> advises its being used, when either a spitting of blood, or a defluxion of thin phlegm, returns at stated times, and orders it to be given before the disorder is expected to return: but he warns us, that there is great danger in taking the bark when an ulcer is already formed in the lungs. Nevertheless it appeared, from the observations contained under the preceding paragraph, when we treated

<sup>s</sup> Humid. Radicale, p. 575.<sup>t</sup> Mon. et Præc. Med. p. 47, 48.

ed of the usefulness of the bark in this disease from its antiseptic qualities, that it sometimes was of great service; and, as was then mentioned, the famous Forti, altho' he did not expect much benefit from the bark, yet owns it did no harm.

As this difficult disease so often baffles the art of the physician, it is no wonder various methods should have been thought of. An anonymous author, in the *Medical Essays* <sup>u</sup>, advises to attempt the cure of this disease by frequent bleedings, especially if the body be not yet quite exhausted: but he would not have the patient bled, before the vomica in the lungs is broken; and advises the assiduous use of detergents and expectorating remedies, before recourse is had to repeated bleedings; or at least he proposes this precaution by way of query. And he appears to have expected a double fruit from bleedings: the one, a diminution of the quantity of blood infected with a purulent taint, while at the same time that which is wasted is re-supplied by a proper and wholesome diet; the other, that by abating the fever less pus would be daily generated; and that both these benefits would abundantly compensate for the loss of blood. On this account he thought, that the same methods might with proper caution be tried, even in those patients whose habit of body was already much exhausted by the disease: and he seems to be confirmed in this opinion, by having observed, that, in these cases, the blood-vessels, although contracted, were yet tolerably full; and that frequently, even in the last stage of a consumption, the menstrual discharge returned at the usual periods: and he apprehends that bleedings are particularly serviceable to those, who were before of a plethoric habit and warm constitution. But as he feared crudities and dropical swellings might be the consequence of copious bleedings, he advises, for preventing these bad effects, the use of the bark, on account of its corroborative qualities, together with frictions and gentle exercise. Dr Mead <sup>v</sup> con-

<sup>u</sup> Vol. IV. p. 413, &c.  
pp. 50.

<sup>v</sup> *Monita et Præcepta Medica*,



confirms this method by his authority; and would have us check this disease in its beginning by bleeding, not once only, but repeatedly. His words are, "If the blood let out is thick, black, or viscid, it is accounted vitiated, and the losing it is useful; on the contrary, if it be red and transparent, it is reckoned sound, and no more is to be taken away." Nay, (although this may perhaps appear a rash procedure), even when the body is almost exhausted and the flesh decayed, he advised the same method. Celsus's rule was, Rather to try a hazardous remedy than none at all. "It may be useful to lower the strength, and by this means weaken at the same time that morbid cause, which would continually impair the strength more and more every day." But he adds this caution, "If a violent fever accompany an ulcer of the lungs, it may be of service to the patient to lose as much blood as his strength will bear; this remedy being repeated, with intervals of time, between each bleeding, sufficient for allowing a proper supply of nourishment." Afterwards he affirms, that, where things are not absolutely desperate, this method of cure has succeeded. But that this treatment did not always succeed appears from hence, that he presently subjoins an apology for ill success; "But if the event prove unfortunate, the physician cannot be charged with taking away a life, which the corrupt state of the bowels made it impossible to preserve." Dr Pringle<sup>w</sup> confirms the propriety of this method by his observations; yet says, by way of caution, that he would not establish from thence a general rule for the cure of this disease, without paying any regard to the patient's strength. He likewise avers, that he had seen very great service done, by letting blood frequently in small quantities at a time, in the cure of wounds, when from pus re-absorbed a hectic was produced; but this was certain, that a putrid cacochymia was lessened by repeated bleedings: at the same time he observes, that the patients are not  
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<sup>w</sup> Observations on the Diseases of the Army, Part III. cap. 3. p. 190, et seq.

so much relieved on the first, as on the second and third night after bleeding.

The same author, on the strength of repeated experiments, recommends, as exceeding useful, the applying of a seton to that side of the thorax which seems to be most affected: he tried this principally on such patients as too much dreaded the too great loss of blood, and therefore were loth to admit bleeding so frequently as was necessary. We took notice of a very happy effect of a seton applied near the suppurated part, on another occasion, at §. 895. in the history of the Pleurisy.

I cannot venture to pronounce any thing, from my own experience, concerning this method of curing a consumption. I have once seen it used, and not without success: but although the patient, in the prime of life, easily bore the loss of blood, and the disease so far abated, and gave so much respite, as that the strength began to return, yet the disorder gained head again, and he has now been ill for several months at the time I write this relation; and the pulse is so weak, and the veins so relaxed, that it does not seem at all safe to diminish any further the little blood yet left in the vessels.

I have learned, however, by a wonderful instance, that the body will bear very copious bleedings with safety to life. I know a noble lady, who having been subject to frequent spasmodic anxieties, sought relief in the paroxysm by bleeding; and at last, against the persuasions of her physicians, has now, for many years, been let blood almost every day, and sometimes twice a-day, losing more or less blood according to the urgency of the complaint; being firmly persuaded, she should quickly be suffocated but for this method; and she is still alive, but languid and confined to her bed.

The last indication of cure is, To consolidate the ulcer. And this we are especially to think of, when we see that the matter spit up has all the qualities of good pus, and that the quantity diminishes daily; while, at the same time, the purulent cacochymia of

the blood being corrected, the hectic is much abated or has quite ceased. In ulcers of the external parts, which are objects of sight, we see that the flesh grows again under laudable pus, and thus the consolidation of the wound proceeds with all possible success. In such a state of the ulcer skilful surgeons change the dressings seldomer, and suck up the moisture with soft feathers: they never wipe it off roughly, lest they should destroy the tender nascent vessels: they soon cover the wound, lest the air should hurt it either by drying it or by cold: lastly, they keep the injured part quiet. The same things are proper in this case also, as far as the condition of the part affected allows. We cannot indeed procure perfect rest for the lungs, nor exclude the air, as respiration is absolutely necessary to life; besides, the pus cannot be drawn from an ulcer of the lungs but by a cough, which always agitates the breast and shakes the lungs; whence we shewed before, how difficult it is to cure this disease. All that art can perform is to abate these inconveniences, by taking care that the breathing be as quiet as possible; that the cough be hushed for a long time, and that it be not more vehement than is necessary, that digested pus may be brought out by spitting after it has been collected and remained quiet in the lungs for some time. For unless this be done, the ulcerated place is exasperated, and the healing impeded by the frequent cough. Wherefore very soft decoctions of healing remedies, with such as correct acrimony, are given; of which kind there is a formula in our author's *Materia Medica*. But the chief dependance is upon anodynes given in the evening; for then the cough is generally most troublesome, and likewise dry, and none or very little digested pus spit out. Anodynes still the cough, procure sleep, which recruits the strength, and in the morning laudable pus is brought up by a gentle cough. Without a prudent use of these, I scarce ever hope for success. Some are afraid, lest the expectoration should be suppressed by opiates, and the lungs be more stuffed up: but I can truly assert, that, after a quiet sleep, I have always ob-



observed a more easy expectoration, and that the pus brought up had every requisite good quality; so that there is all the reason to hope, that under good pus remaining for some hours in the ulcer, the healing will begin in the same manner as we see it does in ulcers of the external parts. This method indeed makes the patient costive: but that is of no bad consequence in this stage of the disease; and a stool may easily be procured by an emollient clyster, if any danger be feared from too violent efforts for expelling the hardened fæces. In the *Materia Medica* under this article, four grains of the *pilulæ de cynoglossa* are prescribed to be taken in the evening: but as this quantity is but equal to half a grain of opium, it will not always be sufficient, so that the quantity must be increased as there is occasion. It is certain that the ancients used opium very freely in the use of a consumption. Aëtius \* advises, for the cure of consumptive persons, (besides *theriaca*, *mithridate*, *antidotum pæoniæ*, *antidotum esdræ*, all which contain opium), a composition, the sixth part of which is pure opium: of this he orders catapotia to be formed, of the size of a vetch: "three or five to be taken at bed-time, drinking warm water afterwards, and you will see (says he) a wonderful effect." Prudence bids us begin by a small dose of such remedies, increasing the quantity gradually as there shall be occasion. But all these compositions of the ancients contained pepper, castoreum, and other warm things, for correcting the noxious quality of the opium, which was believed to be cold in the fourth degree. But these acrid spices are not very proper in this disease: and as the efficacy of the poppy-juice only is wanted here, that may be used alone in various forms; or more simple compositions which are not heating, and whose chief efficacy is the opium as the principal ingredient, may be used; of which various formulæ are to be found in various Dispensatories.

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§. 1211.

\* Lib. viii. cap. 67. p. 91.

§. 1211. **T**HE *third* indication is answered by ptisans, broths, and various preparations of milk.

At §. 1208. those things were enumerated which regarded the cure of this disease: and in the third number thereof, the diet suitable to consumptive persons was considered; of which the general rules were, that such aliments were proper as would easily be digested and subdued by a weak body, and would afford such chyle as might easily pass with the blood thro' the vessels of the lungs. This rule excludes all tough and viscid food from being used by consumptive persons; the food likewise was advised to be such as contained sufficient nutriment, and did not incline to putridity.

*Ptisans* obtain a place in the food of consumptive persons. But although ptisans may be made with various kinds of corn, (for Hippocrates mentions a ptisan of wheat, and Horace speaks of one made of rice, *Tu cessas? agedum, sume hoc ptisanarium oryzae*; "De-  
"layest thou? haste, and take this rice ptisan<sup>a</sup>:") yet custom has caused it to be understood, unless some particular kind of corn be named, that when a ptisan is ordered, it is supposed to be made of barley. How much Hippocrates esteemed this is evident from numerous passages in his works, but principally from his treatise on Diet in Acute Disorders. It was thus prepared among the ancients: They first soaked the barley in water; then they rubbed this soaked barley between their hands in a mortar, till the husk was peeled off, (but which is now more commodiously performed by the help of mills), and then the grain freed from the husk is called *hordeum depuratum*, or *decorticatedum*, in the shops: but they did not pound these barley grains, but boiled them whole in water till they began to swell; then they sometimes added a little vinegar and salt. If this decoction was given with the grains in it, it was called *whole ptisan*; if the

water was strained from the barley, it was called *juice of ptisan*; and when it was boiled to a greater thickness, it was called *cream of ptisan*, which is made at this day in another manner, namely, by pressing the boiled barley with a wooden spoon thro' a hair sieve, and then mixing it with the decoction. Thus a barley pap is made which has the consistence of cream, and affords a mild, moist, softening food, quite contrary to putridity; as it is inclined to turn sour, which it will do in summer, if kept twenty-four hours. Nor has barley ptisan too great a viscosity: the ancients would not have it bruised in a mortar, because then it would have communicated a farinaceous viscosity to the decoction, which it does not if it be boiled whole. It is true, indeed, that they also made use of barley bruised or ground; but then they had taken off its mealy viscosity by other artifices beforehand. Thus, for instance, if barley grains moistened with water be left in a warm place, they will begin to grow; if then they are immediately dried by a strong heat, the growth is stopt; but by the very beginning of this shooting, or growth, the viscosity of the meal is so attenuated, that these grains reduced to a coarse flour, if boiled in water, do not give a thick viscid decoction, but limpid and fragrant, as is evident from the brewing of beer, which is made of barley so managed, and is commonly called *malt*. Galen made a sort of pap with fresh barley a little fried, which he recommends strongly; and which being steeped in water, afforded a pleasant and nourishing drink. In this instance the same operation is performed on the barley, as commonly is on coffee: for if the crude coffee-berries be steeped or boiled in water, they produce a nauseous liquor; but if they be toasted first, the infusion made from them has a most delightful fragrance. The same effect is produced by toasting the barley in the like manner. But as beer is also made from barley, hence in those countries where beer is the common drink, it is also allowed to persons in this distemper. But it must be, as Bennet says, "beer without hops,



“very clear, and not very old<sup>b</sup>.” For hops are used in brewing beer, to prevent its turning sour: but at the same time a bitter taste is produced; which gradually diminishes as the beer grows older, and then the beer is more fragrant: but at the same time it intoxicates if it be drank plentifully, and in that case it would certainly be pernicious in this disorder. But when it is new and clear, it has all the utility of ptisan; and this additional good quality, that by the growth begun in the making of the malt, the viscid lentor of the barley is much diminished: hence certainly such beer affords a useful drink, especially to those who are accustomed to it. In those places where beer is the common drink, they know how to make it medicated for many disorders, by adding various herbs. Thus Bennet<sup>c</sup> advises, that for consumptive persons the beer should, instead of hops, have comfrey-root, nettle-tops, marsh-mallows, endive, purslane, &c. boiled in it.

Vinegar and a little salt were often added to the ptisan of the ancients, especially in acute diseases: but as in phthical cases, especially if there be a very troublesome violent cough, we abstain from these, we correct the insipidity of barley-ptisan, by adding liquorice, and other such things as are most agreeable to the patient's palate. At this day, as is well known, all decoctions which are used as common drink in various diseases, are called *ptisans*; although neither barley, or any other kind of corn, have been boiled in them. Barley, however, was counted by the ancients among the *ολιγοτροφα*, or foods of light nourishment: whence also, among the Romans, as a mark of ignominy, barley was given instead of wheat to those cohorts which had lost their ensigns. And in Polybius, we find the *κριθοφαγια*, or barley-eating, one of the military punishments; as though they who had behaved cowardly in war, were unworthy of the food of stout men<sup>d</sup>. This seems to have been the reason, why the ancients preferred barley to wheat, for making ptisan  
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<sup>b</sup> Tabid. Theatr. p. 151.  
cibaria, p. 24.

<sup>c</sup> Ibid.

<sup>d</sup> Nonnius de re

for the sick; as they had learnt by observation, that wheat was much more tenacious, and more difficult of digestion; of which, by newer observations, we now understand the cause. Beccarius diluted in water flour of wheat, entirely clear of all the bran, and so washed out the finest part of the flour of the wheat; which indeed made the water thick, but, by a very slight shaking, was diffused all over the water, and made what is called *starch*. But this part of the flour being washed away, another substance subsides in the vessel, which being rubbed in the water, and squeezed with the hands, by degrees is kneaded into a soft and very tenacious mass, which will no longer mix with water, and affords a very tenacious glue. But that which seems most amazing is, that this glutinous mass, chemically examined, exhibits the product of the parts of animals, not of vegetables, *viz.* a urinous spirit, oils, and as great a quantity of volatile alkaline salt as is produced from an equal weight of hartshorn. But when he examined the flour of beans, barley, and several other kinds of meal, in the same manner, he did not find in any of them, excepting *spelt*, that glutinous part not to be mixed with water, which has an animal, not a vegetable, quality.

Hence we understand the reason why Galen, as was mentioned on another occasion, §. 586. when, going into the country with two other youths of his own age, for want of other food, being hungry, he greedily devoured some boiled wheat, slightly seasoned with salt, —soon after found a weight in his stomach, had a loathing of food, and a costiveness. About a year ago, some boys eating greedily of ripe wheat, in harvest-time, were all taken ill, and languished a long time, their belly being stuffed up and swelled: two, who had eat the greatest quantity, died dropical; the others were recovered by purging physic, which expelled the putrid saburra, and brought down the swelling of the belly.

However, Hippocrates every where recommends the juice of ptisan in purulent and consumptive cases.

Besides ptisans, *broths* are also justly in esteem; for  
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the flesh of an healthy animal contains copious materials for nourishment, and such too as easily dissolve in water, and may be assimilated by the weakest vessels and viscera. Concerning the cautions to be observed, both in making and using these broths, see §. 28, no 1. It is true, that all animal food has a tendency to putrefaction; but this is easily corrected by orange-juice, or cream of barley, rice, &c. Besides, the flesh of animals which feed on vegetables affords broth much less putrescent than those which are made of the flesh of carnivorous animals. Broths made of the flesh of turtles and frogs have been recommended; and Bianchi<sup>c</sup> attests, that he cured many patients with broth of this kind.

The use of *milk*, especially, is recommended by all physicians in this disorder. Nutrition is defective in this disease, and all the plumpness of the body gradually wastes away. It is well known, that the action of the lungs is of the greatest importance, in order that chyle produced from the food may be assimilated to the humours of the body; whence, what is daily wasted, both in the solids and fluids, may be resupplied. But, in this disease, the lungs are preyed upon by an ulcer, a collection of purulent matter lodges in them, and a troublesome cough agitates them; so that it is not strange, that the efficacy of their action should be diminished. Nothing therefore appears more rational, than that milk should be used as food, as it has already undergone the action of the vasa and viscera in the body of an healthy animal, and is rendered apt to receive in a few hours the qualities of the animal fluids. Before, at §. 28. mention was made of the salutary effects of milk in bodies so weak as not to be able by the strength of their own vessels and viscera to prepare proper nutritious juices: then we recommended, above other kinds of milks, that drawn from the breasts of a healthy vigorous woman; the use of which, Galen mentions as ancient even in his time, and speaks of it with approbation. There are enumerated instances also, in medical history,

<sup>c</sup> Discorso, *se il vitto Pythagorico*, &c. p. 61.



story, which shew the great utility of womens milk in the cure of a consumption; to which numerous like instances might be added, if any doubt remained in this case, and some which I myself could attest the truth of. A young lady of high quality has used human milk for a year and more, with so good effect, that the cough, the purulent spitting, weakness, and emaciation, are quite ceased, and she is alive in health and vigour.

Physicians are used to supply the want of women's milk, by asses milk, which in thinness and sweetness of taste approaches nearest to it; the next best to this is goats milk; and sometimes they use cows milk, which however is thicker. But as there is a subtle juice in milk, which soon exhales and perishes in the air, hence physicians advise, that the milk should be received, as soon as drawn from the animal, into a clean warm vessel; and the vessel being covered, it should be brought directly to the patient, that he may drink the milk warm, especially soon in the morning, and sleep two or three hours after having drank it, if possible. The same should be observed, if the patient drinks womens milk; and this should be repeated three or four times a-day. Aretæus describes, in a few words, the excellent qualities of milk, in a fragment which is left of him, wherein he treats of the cure of a consumption. He says, "Milk is pleasant to the taste, easy to be drank, affording a substantial nourishment, and more familiar, from childhood, to the body, than any other food: besides, its colour is agreeable to the sight; it causes no irritation to the organs of respiration; it lubricates the throat, and makes the expectoration of phlegm easy; it keeps the bowels lax; it is a pleasant remedy for ulcers, and more mild and salutary than any other. If any one drinks a great deal of milk, he will need no other food f." Afterwards he advises ptisans and foods prepared with milk.

We must not however conceal, that many of the best physicians do not allow the use of milk in consumptive

tive cases, without some caution. Hippocrates, after having enumerated many diseases in which he did not think the use of milk adviseable, says, *It is proper to give milk to consumptive persons, if they are not very feverish; and in long and slow fevers, if there be none of the forementioned symptoms; and also to those who are greatly emaciated*<sup>g</sup>. It is well known, that milk is compounded of three substances: 1. Butter, or the fat creamy part; 2. Cheese; and, 3. Thin whey; which last dilutes the two first, and mixes itself equally with both. The creamy part is of its own nature acedcent; but by a considerable febrile heat, it may acquire a rancid acrimony; especially if all the serous part be separated from the fat part, for then nothing is left but fat butter. The cheesy part, which of itself approaches nearer to the animal qualities, is capable of acquiring a great acrimony, and growing putrid; as appears in old cheese, which when burnt emits a smell like that of the horns of animals. But as long as these three parts, the cream, the cheese, and the serum, remain combined, the milk does not grow putrid, but tends to acidity; the other depravations of it are only observed after the parts are separated, which were mixed before. And this is what physicians appear to have dreaded in consumptive persons, from the use of milk; that is to say, when they had a strong fever on them; as Trallian expressly remarks, when he is advising consumptive persons to eat milk, “ if they are not very feverish: for if milk be taken while a vehement heat afflicts the body, it will not equally nourish and moisten the parts, as if there were no such vehement heat; for the quality of the milk is overborne by the morbid disposition, and it assumes a foreign and corruptible quality: when the feverish heat is abated, milk should be given to the patients<sup>h</sup>.”

From these quotations it is sufficiently evident, that the

<sup>g</sup> At tabidis lac dare convenit non admodum valde febricitantibus, et febribus diuturnis et lentis si prædictorum signorum nullum aduerit, et præter rationem extenuatis. *Señ. v. Aphor. nº 64. Charter. Tom. IX. p. 237.*

<sup>h</sup> Lib. vii. cap. 11. p. 309.

the use of milk was then only doubtful when there was a strong fever; but that they did not abstain from milk on account of that slight, continual, habitual fever, usually called a hectic. For the same reason, many physicians have advised, that milk should be drunk in the morning, as towards evening the hectic is more intense. Bennet does not approve of milk at all times, “but to such as have been accustomed to it, and eagerly long for it;” and “in a confirmed phthisis, he thought it absolutely necessary to forbid the use of it.” He thought whey alone, properly medicated, sufficient for every indication; and relates two cases, where the stomach and intestines were found full of hard curds, from the use of milk<sup>k</sup>.

It is true, indeed, as will be mentioned hereafter in treating of the Rheumatism, that whey is capable of nourishing: but it is also true, that the cheesy part is more subdued and assimilated to the animal juices; and therefore, when the body fails of being nourished because it wants strength any longer to make good humours by the action of its own viscera, it will be of use to supply such food as has already been prepared in the body of a healthy animal. Besides, in consumptive persons, the whole fat of the body is wasted, so that the cream of milk seems very proper for supplying this defect; and, indeed, so much the more, as the cream may be diluted with water, while the whey itself, impregnated with the native salt of the milk, is intimately combined with it, and hence may be considered as a soap, in which there is indeed plenty of an oily or fat part, but so united to the salt, that it can be all dissolved in water and watery liquors.

At the same time there is this convenience in it, that with a little trouble various medical intentions may be answered by it. If the disposition of the fluids be very acid, “the cream of milk is excellent balsam both for internal and external use, friendly to the body, softening all acrimony: hence it is a very great reliever in phthical, arthritic, and nephritic cases; and also of excellent service to a wound, and an inflamed  
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<sup>i</sup> Tabid. Theatr. p. 72.

<sup>k</sup> Ibid. p. 75.



“ and exasperated ulcer<sup>1</sup>.” If on account of heat, or a considerable fever, there might be reason to fear that cream would grow rancid, “ skimmed milk (which is “ without the oily fat part) is an admirable remedy “ for curing disorders in corpulent persons, and bilious constitutions<sup>m</sup>.” If a coagulum should be feared from the cheesy part, the milk might be turned, and thin whey made of it, in which the cream might then be diluted, if the medical indications should seem to require this. However, there is an easy method of hindering the cheesy particles from separating too soon, in the *primæ viæ*, from the other parts of the milk, and forming a hard curd; which is, to swallow five grains of Venice soap before the milk is drank. If there be reason to apprehend an acid acrimony in the *primæ viæ*, absorbent powders taken along with the milk will prevent this evil or correct it.

All that we have said, and the almost unanimous consent of the most celebrated physicians, have caused me never to be fearful of giving milk to consumptive persons. Womens milk, as nearest the human constitution, is the best: asses milk comes nearest it in thinness and sweetness: next to these, goats and sheeps milk are recommended: cows milk, which is fatter and more nourishing than all these, has also its use, especially if the cows feed plentifully in good pastures; it may at least be of service to those who dislike the other kinds of milk, or cannot afford them. If the weak body, or oppressed lungs, will not bear milk by itself, it may be given diluted with decoction of barley, or the whey may be drank, which is also very good for deterging the ulcer. Thus also the ancient physicians acted, when they advised asses milk, as being thinner than cows milk, when the ulcer was to be cleansed, and the body to be supported with light nourishment; but when, after the ulcer was cleansed, a healing of the wound was hoped, then they used cows milk.

§. 1212.

<sup>1</sup> H. Boerh, Chem. Tom. II. proc. 99. p. 319.<sup>m</sup> Ibid.

§. 1212. **T**HE palliative cure of a phthisis chiefly regards the cough, the anxieties, and the diarrhœa.

It is indeed true, that the most desirable cure is that which removes the disease, which causes those troublesome symptoms : but this is not always in the power of art. When, therefore, a physician, having no longer any hope of rooting out the disease, turns all his attention to some method of mitigating the troublesome symptoms, this method is called the *palliative cure*. I have known, indeed, some austere philosophers, who condemned this part of physic which treats of the palliative cure, and called it the “ nurse of diseases :” for they thought it wrong that incurable diseases should be protracted ; and that every one had his office and duty in society, which when persons were no longer able to execute, it was better, both for them and the public, that they should leave the world ; and that there ought not to be so much leisure allowed to any one in life, as that he should be employed solely in taking care of his own health. But however, humanity requires us to relieve those wretched persons whom we despair of recovering, and to mitigate those sufferings which we cannot entirely remove, that the little which remains of life may pass more quietly, till death puts an end to their misery. I have seen some of these fastidious philosophers, who talked so haughtily when in health, imploring relief of every one when in the same kind of distress themselves. Add to this, that almost all consumptive persons, although forewarned of the fatal issue of the disease, are lured by vain hope almost to the last breath, and eagerly desire remedies from the physician ; and would it not be cruel to deny these unhappy persons that comfort ?

The three symptoms which principally require to be mitigated, are the vexatious cough, the insupportable anxiety, and the diarrhœa..

§. 1213. **T**HESE are to be relieved by the diet directed at §. 1211, by opiates prudently administered, and by warm liquors.

There is always a cough in this disease; for the nerves of the lungs, even in a healthy person, keep faithful watch to prevent any thing from entering that viscus which may injure it. By exciting a cough, they instantly shake off every thing of this kind; even a drop of water falling into the aspera arteria occasions a violent cough; the ulcerated part of the lungs is perpetually irritated by the pus itself, especially if it become thin and sharp, as is so frequently the case in an incurable consumption; nay, the cough produces a cough, as it exasperates the ulcer by the perpetual agitation of the lungs.

The cough always increases towards the evening, when the hectic fever becomes more intense, and the blood moves with greater celerity through the yet unobstructed vessels of the lungs. Hence an intolerable anxiety or oppression; all which symptoms are exceedingly augmented when a great quantity of crude chyle is carried to the lungs with the venous blood.—To render these symptoms more tolerable, the diet prescribed at §. 1211, must be strictly observed. At the same time, plenty of thin warm drink may be taken to dilute the fluids, that they may more easily pass through the lungs, and thus abate the anxiety. But opiates are almost the only remedy for appeasing the cough, and to prevent, or at least to check the diarrhœa.

It was said before, that, in the last stage of a consumption, the whole blood is so corrupted and dissolved by the pus being re-absorbed, that the fluids, escaping through the meseraic vessels, cause a most putrid diarrhœa, which soon puts an end to the disease and life together: there will then certainly be great perplexities in the physician's way. To prevent these putrid fluids from discharging themselves from the body is dangerous; on the other hand, if the diarrhœa continues, all the strength absolutely fails, and the whole



whole body is exhausted: pains, also, often come on in the abdomen; and an exceeding troublesome and constant tenesmus, which farther exhausts the strength. Almost the only thing physicians are accustomed to try, in order to alleviate the distress of this last stage of the disease, is a clyster; which may be thus prepared: Let a drachm of the purest turpentine be intimately mixed, by rubbing in a glass mortar, with the yolk of an egg; add two ounces of *theriaca andromachi*, then dilute these with four ounces of new milk, and throw them up. The patient must be told to keep the clyster as long as he can, that the pain and irritation of the rectum may be assuaged by this topical anodyne remedy.

## Of other CONSUMPTIONS.

§. 1214. **T**HOUGH a phthisis is generally produced by an ulcer of the lungs, yet it may arise from ulcers in the liver, spleen, pancreas, mesentery, kidneys, uterus, bladder, &c. The diagnosis, prognosis, effects, cure, and palliation, of all which, may be easily deduced by a physician who understands the natural operations of each viscus.

Pus lodged in any of the viscera, may produce all the bad consequences which arise from an ulcer of the lungs; but as the lungs are a vital part, their diseases are much more dangerous. However, the curative indications are nearly the same with those enumerated at §. 1208. For such abscesses are quickly to be brought to maturity; and, when mature, to be opened or broken, and the pus to be discharged by the most convenient passages. In an ulcer of the lungs, the pus is to be discharged by the *aspera arteria*; in an abscess of the liver, by the intestines; and those also of the spleen and pancreas, by the same passage. Ulcers of the kidneys and bladder are evacuated by

the urinary passages; those of the uterus, by the vagina: and so of the rest. But the same cautions are required, and the same remedies are proper, to defend the blood from the purulent infection. It is right also to keep to a diet of easy digestion, and not liable to grow putrid. Besides, under the articles *Hepatitis* and *Nephritis*, we treated concerning abscesses in these viscera; as also under *Inflammation of the Intestines*; to which observations it will be easy to reduce what may be said concerning those abscesses which are formed in the spleen, pancreas, and mesentery. In treating of the diseases attending child-birth, we shall speak of the inflammation of the uterus, and all the consequences of that disease. When we come to consider the Stone, we shall also speak of the ulcer in the bladder, which sometimes brings on an hectic fever and a consumption. From hence it appears, that there is no necessity whatever to treat more particularly of the consumption, as caused by collections of pus lodged in these various parts of the body. Add to this, that not unfrequently a vomica is formed in the lungs, when pus, being re-absorbed into the blood from other parts of the body, is deposited upon this viscus.

As to the diagnostic signs of each kind of phthisis, these may be known from the situation and natural operations of each of these viscera. From the same sources may also be deduced the various methods by which remedies may be applied to the part affected. If, for instance, an abscess be formed in the liver, and the symptoms shew that it may discharge itself outwardly, then the region of the liver should be fomented, and cataplasms applied to it: but as the pancreas is situated under the stomach, a like discharge cannot be hoped in abscesses thereof. Ulcers of the bladder, uterus, and vagina, may be cleansed by injections; but a vomica of the kidneys, after it is broke, may more easily be deterged by mild balsamic diuretics, as almost all natural balsams in a short time communicate their peculiar smell to the urine, as has been said.—The prognostics are likewise to be drawn from  
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the known construction and uses of the several viscera. For instance, ulcers of the kidneys and bladder may be borne much longer, and even be much more easily cured, than those of the liver and spleen; as there is a much easier passage for the discharge of the pus from the kidneys and bladder than from the liver and spleen, and the urine itself perpetually washes these ulcerated parts; and as it is also within the reach of art to allay the acrimony of the urine, and to imbue it with medical virtues, &c. Besides, the liver and spleen being of a very soft substance, are much more easily wasted by an ulcer; and there is always danger, lest a vomica in these parts should break in such a manner, as that the pus, discharging itself into the cavity of the abdomen, and being retained there, should cause a purulent ascites, the cure of which is scarce ever to be hoped.

It appears, therefore, that whatever regards the various kinds of phthical disorders, is easily deducible from what has already been observed.

## Of the D R O P S Y.

§. 1215. **W**HEN watery serum is extravasated and lodged in the cavities of the body, or when, stagnating any where, it over-distends the vessels which contain it, the disorder is called a Dropsy.

A dropsy is a general name, under which many species of the same disease are comprehended; the diversity of which principally arises from the various parts of the body which this watery serum occupies, and from whence it obtains various names.. Celsus has well said, “ The superabundance of some fluid is however common to all of them <sup>a</sup> :” which fluid is however thin and watery; and thence the disease has its name, being wont to be called *υδρεψις*, *υδρεψος*, *υδρεπιασις*, as also *παραεγχυσις*; which last name principally belongs to

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<sup>a</sup> Lib. iii. cap. 21. p. 161.



the dropſy called an *anasarca*, when the water is as it were circumfuſed all over the whole body. Whence alſo Horace <sup>b</sup> calls a dropſy *aquofus languor*.

It is evident from chemiſtry, that water does not only abound in healthy fluids, but is ſo intimately combined alſo with the ſolids, that the horns of ſtags kept for ages yield plenty of water when diſtilled in a retort. But when, from any cauſe, this intimate combination of the water, both with the fluids and ſolids, is diſſolved, then there is danger, leſt the water ſhould eſcape through the veſſels in which it moves, and fall into the cavities of the body; or, if an exit be denied it from the extremities of the veſſels, it will diſtend theſe veſſels, and thus produce a dropſy either way, unleſs it be exhaled from the body by ſome other paſſages.

Before, when we treated of inflammatory diſorders, it was obſerved, that ſometimes ſo great an inflammatory viſciditiy of the blood was produced, that watery liquors could no longer be cloſely mixed with the blood; and hence that they were ſoon expelled from the body, either by thin watery urine or by ſweats, which ſkilful phyſicians deſervedly accounted a bad preſage: but if the water ſwallowed, not being capable of mixing intimately with the blood, is ſeparated therefrom, and nevertheless does not find a paſſage out of the body, this watery ſerum will be collected, and may cauſe a dropſy on this account. Hereafter, at §. 1229. we ſhall find very inflammatory acute diſeaſes enumerated among the cauſes of a dropſy. A dropſical ſwelling of the legs and feet has not unfrequently been obſerved, after perſons have undergone acute diſeaſes. The ſame thing happens, when, the lighter parts of the blood being diſſipated, an atra-bilious, thick, oily, earthy fluid, pervades the veſſels, (ſee §. 1092.) which equally renders the intimate combination of the water with the blood difficult; whence (§. 1229.) melancholy is enumerated among the cauſes of a dropſy, together with the ſcurvy; in which diſeaſe a thickneſs and viſciditiy of the humours

is accounted one cause, as was said §. 1153.

But although this disease derives its name from water, yet that fluid, which in dropfical persons is accumulated in the larger and smaller cavities of the body, has all the appearances of serum mixed with blood. Hence it is called a *watery serum*, because it is not pure serum; for when put on the fire, part thereof evaporates in the air, and part congeals like the white of an egg<sup>c</sup>: which effects are known to be produced by fire also upon the serum of the blood. Now according to the greater or lesser proportion which this serum bears to the thinner lymph, this coagulum is observed in a greater or lesser quantity in the waters of dropfical persons. Having examined, after the operation of tapping, these waters drawn from the belly; I sometimes found a considerable quantity of this coagulated serum, when the waters were put in a clean vessel on the fire; sometimes they were only thickened, by visible flakes of this coagulated serum swimming in them; sometimes the colour of them was only made milky, perhaps on account of the small quantity of serum mixed with a great quantity of lymph. Certainly, if the serum of human blood be put on the fire, it thickens into a mass so solid, as to be capable of being cut like the white of an egg; but if boiling water be poured upon it, it turns the water to a milky colour<sup>d</sup>.

No one at this day doubts that there are vessels in the body, thro' which fluids, thinner than red blood, circulate; so that if the free passage of these fluids be obstructed, the vessels will be distended, and thus a dropfical swelling will be produced. But those arterial vessels, which transmit a fluid thinner than red blood, at their very beginning, where they are widest, have so small a diameter, that they cannot in their nature admit a globule of red blood; so that very great swellings can scarcely be caused from obstructions of these vessels. But the case is different in the venous vessels, which carry the lymph back towards the heart, and pour it into the larger veins, or into the ductus thoracicus,

<sup>c</sup> Acad. des Sciences, l'an 1701. Mem. p. 200. et l'an 1707. Mem. p. 668.

<sup>d</sup> De Haen ratio medendi, Tom. I. p. 101, et seq.

cicus, which may be accounted the vena cava<sup>e</sup> of the lymph. These veins, before they deliver the lymph to the common receptacle, are become of no inconsiderable size; although, collapsing after death, they almost escape the sight: yet then, by inflation, injection, and other artifices, they may be rendered conspicuous. Bertin<sup>f</sup>, an excellent anatomist, not only has observed many lymphatics in the kidneys; but also attests, that he saw a large trunk of a lymphatic half as big as a goose-quill. At the same time he candidly informs the reader, that the lymphatics are most conspicuous to common sight without using any art, if the body be opened when it swells from the putrefaction beginning; for then the cavities of the body swell from the air which the putrefaction causes to expand, which obtains not only in the larger cavities, but also in the cells of the adipose membrane. This is the reason why the bodies of drowned persons, when beginning to putrefy, float again, the tumid abdomen principally rising above the surface of the water; but when the abdomen has burst, an intolerable stench disperses itself all round, and the body sinks again. But as the lymphatics begin to grow turgid, at the same time that the cellular membrane is distended by the air generated, or rather set loose, by putrefaction, he concludes, that even in living bodies there is a communication between the lymphatics and the cellular membrane; and that hence the reason is plain, why, when the lymphatics are diseased, the cellular membrane swells with extravasated lymph.

If therefore, from any cause, the free return of the venous lymph towards the heart be impeded, the larger and smaller cavities of the body may be filled with water, and the lymphatic vessels distended. But as anatomists have so evidently discovered valves in these vessels, it will be difficult to force the lymph back in these vessels, and the part between the valves will swell; and perhaps this is one of the causes whence arise hydatids, of which hereafter.

<sup>e</sup> Boerb. Instit. sect. 126.  
Mem. p. 114.

<sup>f</sup> Acad. des Sciences, l'an 1744.



§. 1216. **W**HICH therefore may take place wherever there are vessels containing this serum, that is, all over the habit of the body, and in every particular part thereof.

Hippocrates has told us, that the whole body is perspirable through all the external and internal surfaces of it; and that there are *carnes attractrices ex cavo & intrinsecus*, “attracting flesh or fibres, which draw the humours out of, and into, the cavities:” Which passage was mentioned in the commentary on §. 323, and §. 333. when we treated of Contusion. Kaau<sup>a</sup> has, by very ingenious experiments, demonstrated, that this perspiration, and on the other hand the inspiration or resorption of the perspired fluid by the veins, obtains all over the body, both in the external and internal parts. This perspirable matter is evident to sight in very intense cold, in the form of a steam, exhaling every where from the skin, the lungs, and the inside of the mouth. If the breast, or abdomen, be cut open in living animals, a like steam exhales, striking the smell with a peculiar scent: but this exhaling moisture in healthy persons is resorbed, before it condenses into a sensible fluid: but after death, especially after the body is grown cold, the condensed vapour is found in the form of water, in the cavities of the body; and the same thing happens in weak health, or rather in a morbid state of the body. This made Hippocrates say, *Every concrete part, whether it be covered with skin or with flesh, is hollow; and when sound, is filled with air; when diseased, with ichor*<sup>b</sup>. As this law therefore obtains through the whole body and each particular part, it is sufficiently evident, that if, from any cause whatsoever, this resorption of the perspirable exhalation be obstructed, it will be collected and condensed into water, and thus will fill and distend the cavity in which it lodges. From whence  
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<sup>a</sup> Perspirat. dict. Hippocrat. per universum corpus.

<sup>b</sup> Omne enim concretum, sive cute sive carne tegatur, cavum: impletur autem sanum quidem spiritu, agrotum vero ichore. *De Arie, cap. 8. Charter: Tom. II. p. 150.*

is evident the truth of the assertion, that a dropfy may be formed “ all over the whole habit of the body, and in every particular part thereof.” Aretæus has well remarked this, saying, “ But sometimes a person labours under a dropfy of some small part, as of the head, in that disease which is called hydrocephalus; or in the lungs only, or liver, spleen, or uterus: and this last kind is more easy to be cured than the rest; for when the mouth of the uterus begins to open after it has been shut up, if it contain water, it will pour it out; if wind, it will exhale it<sup>c</sup>.

This therefore is the general idea of a dropfy; and it is easily seen that different functions will be injured, according as the watery serum is collected in one or other cavity of the body, and impedes the action of various viscera. At the same time it is to be noted, that the collected lymph cannot always be evacuated with equal ease or safety from the cavities in which it lodges. This is the reason why, in this disease, we are carefully to consider what parts of the body it occupies, that we may establish any thing determinate with regard to the cure of it. We shall therefore first treat of the dropfy of the head, and afterwards of other dropfies.

§. 1217. **H**ENCE the disease is called Hydrocephalus, when the watery serum lodges between the external integuments themselves; between them and the skull; between the skull and the membranes of the brain; between these membranes themselves, or their duplicatures; between these and the brain; between the foldings of the brain, or in the cavities thereof, without however causing sudden death.

An *hydrocephalus* properly denotes “ a dropfy of the head;” however, a watery collection of serum in the head has not always this appellation. For unless the parts of the head possessed by it are so flexible as

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to suffer themselves easily to be distended, and thus to make the head appear more bulky, the disease is not called an *hydrocephalus*. When in lethargies, or what is called the *cold apoplexy*, watery serum is collected in the ventricles of the brain, no one will call this disease an *hydrocephalus*, because the firmness of the bones hinders the distension of the head; and hence the bulk of the head does not seem increased, although a considerable quantity of watery serum is accumulated and lodged with in it.

But although water may be lodged, in every age of life, between the skull itself and the common integuments, yet this more rarely happens to adults; and therefore, an *hydrocephalus* is generally a disease of infancy. It is known, that sometimes the foetus, while in the mother's womb, labours under this disorder; and that the size of the head is so increased thereby, that the birth is not only rendered difficult, but sometimes altogether impossible, unless the membranes which contain the water are burst by the efforts of the labour, or an issue for the water be procured by art, and thus the size of the head be diminished.

This disease frequently arises in the infant soon after the birth, and great attention should be used to discover it in the beginning, or otherwise it will be difficult to cure. We know that in new-born children the skull is not entirely ossified, but that considerable membranous interstices are found between the bones of the head, which ossify when the child grows older, sooner or later in different subjects. I have sometimes seen in children eight years old, between the sinciput and the forehead, the opening commonly called the *fontanella* still remaining, and sometimes later, the membranous part not being yet ossified: whence, it is easily seen, that when a fluid is collected in the cavity of the skull, the bones continually recede more and more from each other, and the membranous part is distended; and thus the size of the head may be surprisngly increased, as numerous observations shew.

This disease is divided into an *external* and *internal*



*nal* hydrocephalus. It is called *external*, when the water lodges between the integuments themselves, or between these and the skull: *internal*, when the lymph is collected in the cavity of the skull, in whatever part thereof it may be lodged; for it may, as will be seen presently, occupy various regions. Celsus seems to have known only the external species of this disease, when he treats of diseases which arise in the head; for he says, *When the water distends the skin, and the swelling yields to the pressure of the finger, the Greeks call this disease an hydrocephalus*<sup>a</sup>. And this seems to be confirmed, by the method which he recommends for the cure: *In this disease the person should be close shaved, and a sinapism should be applied, till a sore be produced; if this prove unsuccessful, the knife must be used*<sup>b</sup>. For his intention seems to have been, that by these means a passage might be made for the water, collected between the integuments and the skull, to be evacuated. On the other hand, some physicians of note have doubted whether there were such a disease as an external hydrocephalus; or at least imagined, if it had ever been observed, that it did but seldom happen. Petit<sup>c</sup> owns, that he has observed no other hydrocephali than those produced by watery serum collected in the ventricles of the brain. The cases certainly, in which a hydrocephalus exists from water lodged between the external integuments alone, without any extravasated lymph being found in the cavity of the skull, are very rare. However, as water may be lodged in the cellular membrane all over the body, the same may also happen in the head. But the artificial hydrocephalus, mentioned by Hildanus<sup>d</sup>, was rather an emphysema. The wicked parents of the infant (of whom this story is related) having cut a small hole in the skin of the top of the child's head, by blowing in air, had swelled the integuments to a  
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<sup>a</sup> Ubi humor autem inflat, eaque intumescit et prementi digito cedit, υδροκεφαλον Græci appellant. *Lib. iv. cap. 11. p. 187.*

<sup>b</sup> In hoc tonderi ad cutem necesse est, dein imponere sanapi ut exulceret; si id parum profuit, scalpello utendum est. *Ibid. p. 189.*

<sup>c</sup> Acad. des Sciences, 1718. Mem. p. 121.

<sup>d</sup> Observ. Chirurg.

cent. 3. obs. 18. p. 199.

prodigious size, in order to get money; they were deservedly punished with death.

That a hydrocephalus, whose seat is the external part of the head alone, is rarely seen, is confirmed also from hence, that Aëtius <sup>c</sup>, treating of this disease, describes it indeed as twofold, *internal* and *external*; but at the same time observes, that for the most part there is a collection of water in these cases, but sometimes also of a foul bloody fluid: and among the apparent causes of the disease, he enumerates a blow, or a bruise, by which the vessels are broke, and the blood effused; and takes notice particularly, that these accidents happen when the midwife handles the infant's head too roughly: hence it plainly appears, that under the name of an hydrocephalus, he has described swellings arising from a contusion on the outside of the head. Stalpart van der Wiel, who relates many instances of an hydrocephalus, says, "That such kinds  
" of hydrocephali (*viz.* such as are external) not only  
" are caused by violence or some external cause; but  
" that in these swellings the lymph is always found  
" muddy and turbid, or even bloody; whereas, in  
" internal hydrocephali, the lymph is always clear  
" and limpid <sup>f</sup>" It often happens in a difficult labour, that if the head of the foetus remains any time squeezed between the bones of the pelvis, that then that part of the head which is just opposite to the open orifice of the womb (after the waters are come out) will begin to swell, and we shall find an ecchymosis in this place after the child is born; but it seems not reasonable to call such a swelling an hydrocephalus. This also often happens, when the mouth of the womb, together with the head of the foetus, does not directly answer to the bottom of the pelvis, but lies in a direction towards the side of the pelvis, or the top of the os pubis; for then the infant's head, by the violent efforts of the woman in labour, is bruised against the bones. I remember to have seen a considerable swelling of this sort in a child, whose left frontal

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<sup>c</sup> Lib. vi. cap. 13. p. 99, versa.  
p. 123.

<sup>f</sup> Observat. Rarior. Tom. II.

bone had been pressed for a long time against the edge of the os pubis; till a more skilful midwife being called, by changing the posture of the woman in labour, and prudently handling the child, corrected this perverse situation: but the swelling itself was happily cured, by those remedies which have been heretofore recommended for contusions; and I have seen him since in riper age, stout and healthy. I have seen several like cases; but have never observed what <sup>s</sup> Aëtius seems to hint. For he says, that when such a tumour has been caused by a blow or a bruise, that at the first it is red and painful, but afterwards, the contained humour being changed into a thin substance, at length the swelling is unattended with pain, and of the same colour with the skin. Certainly, if the blood extravasated and collected in this tumour under the skin, is capable of being gradually so attenuated as to be turned into a thin lymph, it may easily be re-absorbed, and such a tumour be cured by discussion, or resolution, as was shewn at large in the chapter of Contusions. In those cases which I have seen, such tumours were entirely dissipated, without any necessity of cutting the skin to make way for the extravasated blood.

It is moreover to be remarked, that there is found sometimes, in new-born infants, a soft swelling of considerable size near the occiput. I have seen some of this kind; and all the children who had it died, and some of them in a short time. Ruysch <sup>h</sup> saw such tumours; and once one so prodigious, that it was bigger than the new-born infant itself. He observes, that these tumours are not properly to be called dropsies of the head, if the rest of the head is sound. However, he remarks, that they have this affinity with dropscical swellings of the head, that the infants soon die if this kind of tumours be opened; as the fluid contained in them for the most part has a communication with the watery fluid which is lodged in the ventricles of the brain. He asserts, that he has sometimes seen such tumours, which were not altogether

<sup>s</sup> Loco citato.

<sup>h</sup> Observat. anatom. Chirurg. n<sup>o</sup> 52. p. 50.



gether filled with liquids, but were partly fleshy, and partly also cartilaginous. Wepfer<sup>i</sup>, however, saw a girl who had such a swelling in the occiput, who lived to be upwards of six years old, although she had had a dysentery and a catarrhal fever: convulsions, and a palsy of the left foot, preceded her death: and on opening the body, it appeared, that this swelling had a communication, by a hole exactly round in the lambdoidal bone, with the internal parts of the head, and the ventricles of the brain contained above a pint of bloody water.

But as all the contents of the cranium are always found moist in those who die a violent death, no one will wonder that watery serum may be collected there, and that in various parts thereof; but most frequently in the ventricles of the brain, as may be gathered from many observations. Certainly the dura mater adheres firmly to the cranium, so that it cannot be torn from thence without a considerable force; and therefore it will be more difficult for serum to be accumulated between the cranium and this membrane, than it will be between it and the pia mater: for although these membranes are contiguous to each other, yet they do not naturally stick together, a moisture being constantly interposed. The membrana arachnoides, which lies close to the pia mater, is of a cellular substance; and, if it be skilfully pierced with the point of a lancet, may be easily inflated and distended with air: lymph may therefore be collected between this membrane and the pia mater, as I have sometimes seen in those who have died of a lethargy: there is then an appearance of a kind of gelatinous substance about the brain, as the collected lymph is every where distributed through innumerable little cells, although, when a puncture is made, thin lymph flows out. Many observations may be read in Stalpart van der Wiel<sup>k</sup> concerning water collected in various internal parts of the head. But one which most remarkably evinces the truth of this, is the accurate examination of a foetus,

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<sup>i</sup> Observat. Medic. Pract. de Cap. Affect. n<sup>o</sup> 23. p. 46. <sup>k</sup> Observ. Rarior. Tom. II. p. 112, et seq.

of which a poor woman <sup>1</sup> was with great difficulty delivered, on account of the prodigious size of the head. On opening the body, the integuments of the skull being cut asunder, only a small quantity of lymph was found in the cellular membrane; but the pericranium, which was swelled up in the form of a bag, and divided from the bones of the skull, contained a reddish lymph in large quantity; the dura mater was every where loose from the upper bones of the skull, but it adhered to the pericranium; at the place of the futures, some pints of lymph were lodged between the pia and dura mater; the pia mater itself was nearly in its natural state; the brain, depressed by the weight of the incumbent lymph, had altogether lost its convex form, insomuch that the lobes thereof were so flattened, as to be on a level with the corpus callosum; the rest of the brain, the medulla oblongata, and one lobe of the cerebellum, were squeezed to a pap. In this instance, lymph appeared to have been collected both in the external and internal parts of the head.

Numerous observations shew, that the lymph contained in the ventricles of the brain is the cause of a hydrocephalus; and it was noted before, that Petit had observed no other species of hydrocephalus. What seems most wonderful is, that so great a quantity of lymph can be contained in the cavity of the skull. Vesalius <sup>m</sup> saw at Augsbourg, a girl of two years old, whose head, in seven months time, had increased to a wonderful size; and after death, near nine pints of water was found in the ventricles of the brain. At the same time he observes, “ that the skull was entirely  
 “ membranous, with only so much of a bony substance  
 “ remaining, as was equal to the space of the girl’s  
 “ skull before the head grew to an immoderate size.” No collection of water was observed in any other part of the body; the cerebellum, and the whole basis of the cerebrum, as also the origin of the nerves, were in a natural state; and the girl preserved the use of all  
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<sup>1</sup> Corn. Henr. Velsæ Dissertat. Miscell. Anat. Pract. p. 39. <sup>m</sup> De Corp. Human. Fabrica, lib. i. cap. 5. p. 17.

her senses to her death, Vesalius, who saw the girl a few days before her death, observed, that if her head was moved by the people about her, or was held up ever so little, that then immediately a cough and difficulty of breathing followed; her face was flushed with blood, and tears dropt from her eyes. 'Tulpius'<sup>a</sup> saw an hydrocephalus in a boy of five years old, in which the swelling contained five pints of water; which being evacuated, the whole cavity of the skull appeared so empty, that most who saw it thought the brain was wanting: it appeared however, that the brain was there; but that, "having lost its round figure, it had assumed the form of an arched vault; and that its soft yielding medulla was so distended by the vast quantity of water, that it adhered on all sides like a thick membrane, to the arched surface of the disjointed bones." However, the father of the boy solemnly averred, that the mental faculties had been unimpaired. And we read<sup>o</sup>, that above twenty-four pints of water were taken out of an infant's head, before several witnesses.

It may justly surprize us, that any one could survive, and that for so long a time, when the head was filled with such an enormous quantity of water, since often a few ounces of blood extravasated under the skull have been the cause of sudden death. But in very young persons, the bones of the skull are easily capable of giving way, being joined only by membranous interstices; nor is so great a quantity of lymph effused all at once, but is collected gradually and successively. It is still more wonderful, that in some persons the senses remained unimpaired, although the form of the brain was so prodigiously altered (as well by the pressure of the incumbent water, as by the great distension of the ventricles) as that it seemed to be wanting, not only to the vulgar, but even to physicians: and altho' the facility of extending the bones of the head, in very young persons, will go a great way in accounting for this, yet the difficulty is not wholly solved by it. For

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<sup>a</sup> Observat. Medic. lib. i. cap. 24.  
 an. 1. p. 25.

<sup>o</sup> Miscell. Curios. dec. 3.



the size of the head has been observed to be increased, although the bones had acquired their usual hardness in proportion to the patient's age; and yet it manifestly appeared, that the functions of the senses were uninjured: but the bones of the head were so thin, as that, in a strong light, the contents might be seen thro' them<sup>p</sup>. But we have another instance of an hydrocephalus, in a boy of eight or nine years old, in which the bones of the forehead, of the top of the head, and of the occiput, were more than a sixth of an inch thick; and yet three pints of water, without any smell, were taken out. When the skull was cut open, the skilful anatomist<sup>q</sup> found no traces of the brain, but only the medulla oblongata. He owns he could not tell whether the boy had the use of his senses, or of speech; he was able, however, to live so many years. Hildanus<sup>r</sup> saw a youth of eighteen, whose head was of an immense size: It had begun to swell when he was about three years old, after he had undergone an acute disease: the rest of his body was extenuated: "the skull was not membranous, as it generally is in the hydrocephalus; but felt hard and solid to the touch:" he spoke distinctly, but had not his perfect understanding, and was subject to terrible epileptic fits. A man used to shew himself at fairs, who, from the beginning of life, had laboured under an hydrocephalus; and he was indeed very languid, but however was above thirty years old: his head was of a prodigious size, though the rest of his body was not bigger than that of a boy of ten years old: he had his senses, but was of dull intellects, nor could he move about much; and indeed, the great weight of his head hindered him from sitting upright any long time, unless he was supported by pillows put behind.

When late posterity shall find in burial-places such prodigious skulls, there will not undoubtedly be wanting some, who, from calculating the proportion of this to the other parts of the body, will conclude, such a skull

<sup>p</sup> Betbeder Histoire de l'Hydrocephale de Begle, p. 35, et seq.

<sup>q</sup> Du Verney Traite des Maladies des Os, Tom. II. p. 8. <sup>r</sup> Observ. chirurg. cent. 3. obs. 19. p. 199.

skull belonged to a giant of an immense stature, especially if at the same time the bones of such a skull shall be found thicker than common; as was the case in the skull which Du Verney saw, of a boy of nine years old. If a whole skull of this kind were to be dug up, the truth might be known, as the bones of the upper jaw would retain the natural size, although the bones of the cranium were immeasurably increased in size. But if the bones of the skull are found already disjoined, this criterion cannot take place. Ruysch<sup>s</sup> preserved the left sincipital bone of a giant, of so vast a size, that it might have served for a helmet for the whole head of a common man. Ruysch knew it to be a human bone, and he could not well be deceived in affairs of this nature: “But the sexton of the new church in this city, (says Ruysch,) told me, that he dug this up among other bones, which were not extraordinary enough to induce him to keep any of them.” Certainly if this sexton had found any other bones of this supposed giant’s skeleton, he would have offered them to Ruysch, or to the worshipful burgomaster of Amsterdam, D. J. Witsen, who kept the sincipital bone in his museum. Add to this, that the history of the country makes no mention of any giant of so huge a stature having ever existed; who, however, must have drawn all mens eyes upon him while he lived.

§. 1218. **I**T is easy to know, that the last kind is incurable: the others may be cured by slight burning, trepanning, or puncture, cautiously and gently applied; and by the use of internal hydragogues, and strengtheners; or they may be dissipated by external discutients.

It is required to the cure of every dropfy, as will be said hereafter, §. 1231. that the waters, effused into the different cavities of the body, be dislodged from thence. But when a large quantity of watery serum lodges in the cavities of the brain itself, it is easy to see that it cannot be drawn off from thence. Puncture

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at least cannot be used; as, before this could have effect, we must bore through the whole substance of the brain, and the corpus callosum itself. And the resorption of the extravasated serum from the cavities themselves of the brain, can scarcely be hoped, unless there be a very small quantity indeed lodged there: and then it will very difficultly be effected; as the serum was accumulated there for this very reason, because the veins did not sufficiently resorb the moisture perpetually oozing from the mouths of the arteries. If there be therefore any hopes, they must be founded on the cure being attempted in the very beginning of the disease; therefore all those symptoms, which afford any suspicion of this disease beginning, are attentively to be watched.

Petit <sup>a</sup> has remarked, that this disease sometimes arises after difficult breeding of the teeth, or violent convulsions; and also when children have been much troubled with worms. In the beginning of the disease, the lips and eye-lids are slightly convulsed; the patient bites his lips, gnashes his teeth, and rubs his nose. The belly is either too much bound, or too lax. The eyes appear languid; the pupil is uncommonly dilated; the patient grows pale, weak, melancholy, and languid. The principal signs which shew the disease approaching are stupidity and sleepiness, certain symptoms that the brain is already oppressed by the watery serum collected in the head: then as the disorder increases, the bones of the head begin to recede from each other, the size of the head increases, and leaves no room to doubt of the existence of the disease. All the preceding symptoms denote, that the functions of the brain are gradually more and more impaired: which alteration is less perceptible in infants of only a few months old; but when they have past one year, this change is more obvious to remark. Thus we read of a boy <sup>b</sup>, who enjoyed perfect health till he was two years and a half old; when he began to be attacked by this disease. His speech then

<sup>a</sup> Acad. des Sciences, l'an 1718. Mem. p. 123.  
1705. Hist. p. 70.

<sup>b</sup> Ibid. l'an



then grew less distinct, he learnt nothing more, his memory perished, his senses grew duller and duller, and at last quite failed: no water was found either in the external parts of the head, although greatly increased in size, or between the meninges; but, on piercing the brain, a great quantity of transparent lymph issued forth, which had no bad smell at all. Besides the signs already mentioned, and particularly the perpetual stupidity, I have sometimes remarked, that persons afflicted with this disorder cannot bear an erect posture of the head, without crying out; but as soon as they lean back their head supported by a pillow, they are easy, but stupid. I have ventured from these signs to foretel an accumulation of watery serum in the ventricles of the brain, although the size of the head was not remarkably increased; and on opening the body, it appeared I had conjectured rightly: I have always found the fluid collected in these cases to be limpid, and without any fetid smell.

Hippocrates has described the signs which shew themselves "if water gathers in the brain:" But he does not mention as one, the increased size of the head; and the other circumstances which he describes in this disease, plainly enough declare, that he is not here treating of an hydrocephalus in young children, the bones of whose skull may be made to recede from each other, but of a collection of water formed in the brain of a grown person. These signs he thus enumerates: *An acute pain infests the sinciput and temples, and sometimes seizes the patient in other parts of the head, and they have at times shiverings and a fever; a pain is felt about the region of the eyes, and they grow dim; the pupil seems to divide, and the patients see double; and upon rising up, they are seized with a giddiness and dimness of sight* <sup>c</sup>, &c. If these symptoms are compared with those which Petit <sup>d</sup> observed in the bodies

<sup>c</sup> Dolor acutus sinciput et tempora, interdumque alia capitis parte, distinct. Subindeque rigor et febris; oculorum regiones dolor occupat, sique caligant, pupilla scinditur, et ex uno duo sibi cernere videntur, et si surrexerit ipsum tenebrosa vertigoprehendit. *De Morbis, lib. ii. cap. 6. Charter. Tom. VII. p. 556.*

<sup>d</sup> *Ac. d. des Sciences, l'an 1718. Mem. p. 123.*

dies of persons who died of this disorder, the reason of these symptoms will be sufficiently evident. He found the dura mater adhering more firmly than usual to the skull; the basis of the cranium flattened, and as it were depressed; the orbits of the eyes, and the eyes themselves, thrust outwards. In very young children we can scarce learn, by inquiry, what incommodious symptoms they feel; more especially as in the progress of the disease they grow more and more stupid, and their speech grows weaker and more indistinct: however, by a grievous crying night and day, they shew that they feel pain; as Listre<sup>e</sup> observed in a boy, who was ill two years of this complaint, and slept very little during the whole time, but was perpetually crying.

When, from these symptoms, I suspected that water was lodged in the internal parts of the head, I ordered the hair to be taken off, and recommended gentle friction, which the patient easily bore. I then directed that the head should be covered with a soft aromatic plaster, such as the emplastrum de labdono or meliloto of the shops; this was removed twice or thrice a-day, that the head might be rubbed. I ordered the parts behind the ears to be rubbed till they became red; for we frequently see a quantity of matter oozing from behind the ears, and indeed from the whole skin of the head, which, if it be imprudently stopped, the brain is soon affected, and all its functions disturbed.

I tried this method on a girl of nine months old, and was pleased to find a considerable moisture near the right side of the fontanella, and the skin of the whole head, and particularly behind the ears, constantly bedewed with so much moisture, that the child's caps were frequently changed on this account. I carefully examined the head every day, and found it did not increase in size. I used at the same time such gentle physic as suited the tender age of the patient: but all was to no purpose; for the child died in a fortnight, after a few slight convulsions. I found  
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in the ventricles of the brain above six ounces of clear water.

If nine parts of the emplastrum de meliloto be used to one part of the emplastrum vesicatorium, and this, being spread on a rag, be put on the head, (the hair being first cut off with scissars, but not shaved), the skin is lightly irritated, and begins to look a little red; but the epidermis does not rise in blisters, as a small quantity only of the emplastrum vesicatorium is used; and on account of the remainder of the hairs, the head not being shaved, but the hair only cut, the plaster does not come into immediate contact with the skin; and the skin generally begins to grow moist. When running sores of the skin of the head have been imprudently stopped by drying remedies, (by which perverse management, convulsions, or dreadful inflammations of the eyes, or a dangerous asthma, have been brought on), I have used this method with success; for the excretion of the ichor through the skin soon returns, to the relief of the patient from all these bad symptoms: Whence it appears, that some good may be hoped from the use of this method, especially in the beginning of the disorder.

Bags filled with cephalic herbs, such as sage, rosemary, lavender, &c. are sometimes applied to the head, to which it is usual to add a quantity of decrepitated sea-salt, which soon draws moisture of itself, even from the very air.

At the same time a gentle and cautious compression of the whole head, supports the parts, and enables them to resist too great a distension. For this end a cap of Turkey leather is usually prepared, which is drawn gently together by buckles, so as rather to support the parts than strongly to constrict them: but this is to be used in the beginning of the disease only; for when the hydrocephalus comes to a considerable bulk, such a compression might cause a fatal apoplexy.

Cathartics are given frequently, that, the body being exhausted of fluids, the veins may more readily absorb the extravasated lymph.

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When the collected water is lodged between the integuments and skull, it may easily be evacuated by scarification, or by burning, which leaves an ulcer longer open, and by which the watery serum continually flows; but, when it is lodged in the cavity of the skull, the difficulty is much greater. If it lodges in the cavities of the brain, it cannot be drawn from thence by puncture; but if the water be collected between the meninges it would indeed be easy to pierce there: but when the water was drawn out, the soft bones, united only by a membranous substance, would collapse and compress the brain, when the head was laid on a pillow.

It is indeed true, as will hereafter be observed when we come to speak of the general cure of a dropsy, that the curative indication requires the evacuating the water from the cavities of the body. But almost all observations shew, that puncture is fatal in an internal hydrocephalus; and Petit<sup>f</sup> laments that all who underwent this operation died: for if a large quantity of water is drawn off, they expire in four or five hours after the discharge; if less be drawn off they died slower; but none survived the operation above forty hours. La Motte<sup>g</sup> absolutely condemns the puncture in an hydrocephalus, as always fatal; and when another bolder surgeon performed the operation on a boy of three months old, after the water was let out, the bones subsided, and death ensued the next day; although the water let out was perfectly clear, and lodged between the skull and the dura mater; which species of hydrocephalus might seem to afford more hopes of a cure than the others, where the water is lodged deeper in the head. Hildanus<sup>h</sup> is of the same opinion: and we read in Wepfer<sup>i</sup>, that he refused to perform this operation on a boy of five years old, although the mother was very urgent for it; and he was afterwards informed, that some surgeon had performed it, and that the patient died of it; although at this age a greater firmness of the bones might

<sup>f</sup> Ibid. Jan 1718. Mem. p. 122.  
 surg. Tom. II. p. 131, &c.

obs. 47. p. 198.

obs. 49. p. 49.

<sup>g</sup> Traite complet de Chi-

<sup>h</sup> Observat. Chirurg. cent. 3.

<sup>i</sup> Observ. Medic. Pract. de Cap. Affect.

might be expected, so as that they would be less liable to subside after the water was let out. As therefore I have never seen any escape on whom this operation has been tried, and as the most approved authors reject it, prudence seems to direct, that patients afflicted with an internal hydrocephalus should be left to take their fate; especially as certain experience shews, that many live a long time with this disorder, although miserably.

It is indeed true, that Aëtius<sup>k</sup> has recommended incision, both in the external and internal hydrocephalus: but at the same time he says, "That the ancients had observed, that water was sometimes collected between the membranes and the brain; which disease is mortal." Hippocrates<sup>l</sup>, after he had tried to draw off the water contained in the brain, principally by repeated purges, advises, as a last remedy, that an incision being made in the head, the perforation should be continued even to the brain: but, as was remarked a little while ago, he does not seem in this place to speak of an hydrocephalus as a disease of infants, in whom the bones are soft, and will easily subside, but of water collected in the cavity of the skull of adults. At the same time it is very evident, that the piercing of the skull can only give issue to water lodged between the skull and the meninges; or between the meninges and the brain; but that the watery serum contained in the ventricles of the brain itself can never be let out this way.

Nay, if the lymph contained in the ventricles of the brain could be drawn off without injuring the brain by the wound, yet it should seem that the parts would collapse on the evacuation of the lymph, and destroy the functions of the brain. This seems confirmed by that disease in new-born infants called the *spina bifida*, or double spine, because the articulations of the vertebræ seem to open, and a soft tumour of a various size grows there, sometimes containing a clear water, sometimes a darker fluid, and the integuments some-

<sup>k</sup> Lib. vi. cap. i. p. 99, versâ.  
 Charter. Tom. VII. p. 556.

<sup>l</sup> De Morbis, lib. ii. cap. 6.

times keep their natural colour, but more frequently they are red or rather livid. Ruysch describes this disease; and asserts "that it is a dropsy of a part of the spinal marrow, and is almost the same disorder with that which in infants is called an hydrocephalus<sup>m</sup>."

This tumour appears in the back or loins, and sometimes, but indeed seldom, in the nape of the neck, and very rarely in the lower and exterior part of the os sacrum; which surprised Ruysch, as the lower part of the os sacrum, even in a natural state, has an opening in its back part. But although the vertebræ for the most part gape only on the back part near the spinal processes, the main body of the vertebræ remaining entire; yet he observed in a dead body a single opening in the vertebræ, which was scarce big enough to contain a vetch: but he owns, that none of the infants, whom he attended in this disease, escaped; and he saw that death was always hastened, if this swelling broke of itself, or was imprudently opened. For this reason, before Ruysch's observations, we find Tulp<sup>n</sup> cautioning surgeons not to open such swellings.

The whole cure therefore is only palliative; and consists in taking care, that the integuments which contain the tumour be not burst, either by incautiously touching them, or by attrition; but rather, that by astringent and strengthening fomentations the integuments be rendered firmer, that the tumour may remain longer whole and inclosed.

We read<sup>o</sup> of an infant kept alive to his fifth year by this means: and perhaps the child lived beyond that time; for the author speaks of him as living at the time he wrote, and as then past five years old. But for the most part children die sooner, as either by accident, or imprudent treatment, or by a mortification coming on, an issue is procured to the lymph which causes the tumour. If persons afflicted with an hydrocephalus can live so long, there may be hopes of pro-

<sup>m</sup> Observat. Anatom. Chirurg. Cent. obs. 34, 35, 36. p. 33, et seq.  
<sup>n</sup> Lib. iii. Observ. Medic. cap. 29, 30. p. 232, et seq. <sup>o</sup> Abram Tiffing over de tegennatuurlyke splyting de Ruggesgraat, p. 69.



prolonging life in the disorder of the double spine.

Perhaps the water contained in the *spina bifida* descends from the ventricles of the brain; for we know that the fourth ventricle is continued along the medulla spinalis. There is an observation in Wepfer<sup>p</sup> which seems to confirm this opinion. A girl whose head was well formed, had on the back towards the right side of the upper vertebræ of the loins a livid bright spot, about five inches long and three broad, which daily increased in size, but yet not to exceed the thickness of the finger, and at the same time it grew so bright as to shine like a mirror. Her right foot was immoveable from her birth. On the tenth day after she was born, as the water was visible through the skin, the surgeon made a very small incision, from which issued an absolutely lymphid water. The wound soon closed, which the mother afterwards opened six times with her nails, and discharged from it three ounces of water at each time. The surgeon healed up the part; but as soon as it was cicatrized, and the spot disappeared, first the right frontal bone, and then the left, began to protuberate, and an hydrocephalus of a vast size appeared when the child was about a month old. It is evident, this lymph issued from the ventricles of the brain, and its exit being hindered, the head began to fill by its accumulation, and was every way distended.

At the same time it appears, that as, even in a place so distant from the head, a discharge of the extravasated lymph could not be produced with safety; but that in all such cases the most respectable authors testify, that death always ensues, for the most part in a few days; a fatal event is much more to be expected, if puncture be attempted when the internal parts of the skull are filled with watery serum accumulated there.

§. 1219. **I**N a dropsey of the chest, where water may be collected from various parts,  
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the symptoms are almost the same with those of an empyema, but observation of the antecedent causes will discover the difference between them. Tapping cures this kind of dropsy, giving at the same time such remedies as are opposite to its cause.

It was said, in the commentary on §. 1217. that a perspiration of fluids, and a resorption of the perspired fluids, took place in all the cavities of the body, both great and small. This will therefore be applicable to the cavity of the breast; nay, this perspiration of the humours should seem to be very considerable in the chest, as the humours are propelled by the whole force of the heart through the neighbouring vessels. Certainly the surface of the lungs, which is in contact with the air, breathes forth at every expiration of air a vast quantity of moist vapour, which vapour is not visible in warm summer weather, but is dissipated in an invisible exhalation in the air: but in a severe winter, it is expelled from the mouth and nostrils of men, and of large animals, in the form of a thick cloud; and indeed in much greater quantity, and with greater force, than from the rest of the surface of the skin; as is very plain, if any one rising from a warm bed (in an intense frost) exposes himself to the cold air for an instant: his hands smoke, indeed; but a much more copious steam issues from the nostrils and from the mouth. This phenomenon frightens black servants (who have always lived in a very hot air) when they come to the colder climates of Europe. But Kaau<sup>a</sup> has demonstrated, by direct experiments, that the external surface of the lungs, the whole pleura, the mediastinum, the pericardium, the heart, and the auricles, perpetually exhale a vast quantity of moist vapour. The circulation of the blood is swiftest of all thro' the coronary arteries; hence all the surface of the heart continually emits from its surface a great quantity of this thin vapour; so that if, by a quick incision,

<sup>a</sup> Perspirat. dicta Hippocr. p. 239, et seq.

tion, the heart be laid open to the view, it reeks all over: wherefore, even after death, when the body is quite cold, a greater quantity of moisture is found in the cavity of the pericardium than in any other cavity of the body in proportion to its size.

But altho' in healthy animals all the internal parts, both containing and contained, are constantly found moist; yet no fluid is found collected in them, if the animals are dissected alive, or presently after death: therefore this moist steam exhaling from the arteries is reformed by the veins, as has been shewn by curious experiments<sup>b</sup>; and these absorbent veins empty themselves into the thoracic duct, or into the veins which convey the blood<sup>c</sup>. So that there are passages by which the thin lymph, expelled from the last order of exhaling arteries into the cavities of the body, may be returned again to the mass of the circulating fluids; and thus an accumulation of any fluid, or a stagnation of it when accumulated, will be prevented.

But although, in health, it should seem that the moisture exhaling from the arteries is reformed in the form of a steam, and before it is condensed to lymph; yet it has been made appear, by direct experiments, that the vapours when condensed, and the water itself accumulated thereby, may be re-absorbed by the veins. Musgrave<sup>d</sup> injected with a siphon, four ounces of warm water into the right side of the thorax of a live dog; whence followed a difficulty of breathing, and a manifest debility: however, by degrees these complaints diminished, and in a week's time the animal seemed as well as ever. Afterwards, in like manner, he injected sixteen ounces of warm water into the left cavity of the thorax of the same dog; the animal's breathing grew difficult, he grew very hot, and the heart beat very strong, but in a week's time the dog was well again. Afterwards he injected into one side of the thorax eighteen ounces, and into the other only six: all the same symptoms followed; but disappeared sooner, for the dog was well again in five days.

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<sup>b</sup> Ibid. p. 274, et seq.<sup>c</sup> Ibid. p. 279.<sup>d</sup> Philosophical



At the same time he observed, that the creature made a greater quantity of water than usual.

We shall speak of the causes of a dropsy at §. 1228. It will be sufficient to observe here in general, that every cause which may obstruct the speedy absorption of the exhaling moisture by the veins, may be a cause of a dropsy of the chest. Hence, the reason is plain, why, after a spasmodic asthma of long continuance, a dropsy of the chest so often follows. For in this kind of asthma, the right ventricle of the heart is incapable of propelling the blood through the lungs, on account of the constriction produced by the spasm: hence the vena cava cannot discharge itself; therefore all the veins are distended, and the lips of these unhappy patients grow livid and swell; and on this account also the lymphatic veins cannot transmit lymph which they have resorbed to the sanguiferous veins, which are distended from being over-filled with blood: yet the arteries in the mean time continue to exhale the moisture; hence, lymph is accumulated, or the tender lymphatic veins burst, and a perpetual distillation of lymph into the thorax ensues. These disorders are more especially to be feared, if the asthmatic paroxysms have been severe, lasted long, and returned frequently.

Perhaps, there is not a more frequent cause of this watery collection in the chest, than drinking of cold liquor when the body is over-heated, or staying too long without motion in a cold air. How hurtful such imprudences are, was remarked before, in the history of the pleurisy, as far as relates to their occasioning inflammatory diseases. But in persons whose fluids are not disposed to an inflammatory visciditv, a dropsy of the breast is frequently the consequence of such irregularities: for such sudden cold constricts the orifices of the vessels, especially those of the venous absorbents, rather than the small exhaling arterial vessels, because the veins have thinner coats than the arteries, as also because the motion of the fluids thro' the arteries towards their extremities keeps them open, or opens them if they have suffered any degree of

of constriction. But the case is different with the veins: for if they are once contracted by cold, they close more easily; and if this happens in a great number of absorbent veins, an incurable dropsy will be occasioned, as the absorption cannot then be restored. It is a known custom among the Dutch, that boats set out at stated hours from one city to another; as the boat is loosened from the shore at the ringing of a bell, people often walk very fast to come in time to the boat, which entering moist with sweat, and sitting still there for some hours, if the wind blows fresh or the weather be cold, it frequently happens that by these means they become asthmatic, and collect a quantity of watery serum in the cavities of the breast.

It is well observed in the text, that lymph may be collected in various parts of the thorax. On another occasion, §. 913. it was explained, not only how the pleura lines the whole circuit of the inside of the chest, but also in what manner the mediastinum, dividing the thorax into two parts, is formed. Lymph therefore may be collected either in the right or left cavity of the thorax, or in both; it may also be collected in the cavity of the pericardium, round the heart. It was also there observed, that each cavity of the thorax had its own proper membrane; so that we might conceive of the pleura as of two distinct membranes, or as two hollow bladders lying by the side of each other, and sticking together at the place where they touched, so as that from the duplicature of these membranes the mediastinum took rise, dividing the cavity of the thorax into two partitions. At the same time it was noted, that the pleura receding on each side from the vertebræ left a kind of triangular cavity, the back part of which was the column of the vertebræ of the back: this cavity is occupied by the cellular membrane, thro' which pass the aspera arteria, the œsophagus, &c. but forwards the lamellæ of the double pleura cohere more closely, except that towards the upper part they leave a vacancy in which the thymus gland is situated.

The collected lymph therefore may be lodged in five distinct regions of the thorax; namely, in the right  
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and left cavity, in the pericardium; behind, without the pleura, near to the vertebræ: before, under the sternum, between the two lamellæ of the pleura. These different seats of a dropfy ought to be accurately distinguished, both because they produce different symptoms, and require different methods of cure. For if the lymph be lodged in either cavity of the thorax, it may be drawn off by tapping; if in the pericardium, by puncture; if under the sternum, by a perforation there. But if it be collected in that triangular cavity formed by the membranes of the pleura receding from each other near the vertebræ of the thorax, it will make itself a passage by its own weight through the cellular membrane which invests the dorsal muscles, and fill up their interstices: and in the same manner as pus is formed there, it will form sinuous ulcers; as was also remarked §. 913.

As a dropfy of the breast is attended with many symptoms resembling those of an empyema, great attention is required to find out the diagnostic signs. For a fluid contained in the cavity of the breast, be it pus or watery serum, will equally compress the lungs, and hinder their free motion: and pus, by length of time, degenerating into an acrid ichor, will irritate the parts which it touches, equally as the lymph when it begins to grow putrid. Albertini<sup>c</sup>, by careful examination of this disease, and dissection of bodies, has found, that the fluid stagnating in the thorax, if it be pure water, does not bring on so great a difficulty of breathing, unless it almost fills both cavities of the breast, or distend either of them so much as greatly to diminish the space of the other by compressing it; but when the extravasated fluid is turbid, of a deep yellow, or very acrid, that then even a small quantity of serum collected in the cavity of the breast will cause a very considerable difficulty of breathing.

But if we attend to the antecedent causes, we shall then be able to make the proper distinctions. For instance, if signs of suppuration follow an inflammation of the breast, attended with a difficulty of breathing,

<sup>c</sup> Instit. Bonon. Tom. I. p. 393.



ing, we may readily conclude that matter is formed. But above, in the chapter of the Phthisis, it was shewn, that vomicas of the lungs were sometimes so concealed, that neither the patients nor the physicians suspected any such disease, before pus was thrown up by coughing, or that they found an empyema on opening the body. But if the causes which have a tendency to produce this disease have preceded; if the person be of a cold, leucophlegmatic temperament; if the face be somewhat swelled, or the feet, legs, thighs, and scrotum swell; then we may be sure of a dropsy: and if then there be a difficulty of breathing; or, on shaking the body, the sound of the fluid moving in the breast be perceived; we have still a more certain diagnostic of this disease. Besides, we know, as was observed above, that a dropsy of the breast frequently follows a convulsive asthma; wherefore, when this disorder has foregone, we have reason to suspect the other. If either cavity of the breast be filled with water, the patients cannot lie on the opposite side; if the water is lodged in both the cavities, they bear an erect position, the body being a little bent forwards, more easily. An oedematous swelling of the feet not only frequently accompanies this disease; but the breast is also relieved if the swelling in the legs and feet increases, as I have frequently observed; and on the contrary, if the swelling in the legs disappears suddenly, the patients are seized with a violent oppression in their breast. Another symptom also frequently shews itself, (although I have not always observed it) which Piso held for a certain pathognomonic; namely, "a difficulty and quickness of breathing, which suddenly comes on towards bedtime, and deprives the patient of rest, but as the day approaches gradually abates f." At the same time he observes, that he has seen a palsy, sometimes of one and sometimes of both arms, in patients labouring under a dropsy of the chest. But though it is very right to attend to the antecedent causes, and all the symptoms above-mentioned; yet an oedema

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ma of the external parts, together with a difficulty of breathing, afford sufficient room to suspect this disease.

Lymph has also been observed to be collected in the pericardium. It has been said already, that the internal surface of the pericardium is always moist in healthy animals; as are also the heart, the auricles, the sinuses, and the larger vessels contained in the cavity of the pericardium. And certainly there are no where greater causes for producing secretion than here. For we learn by anatomical injections, that the pericardium abounds with innumerable arteries, through which the attenuated blood, returning from the lungs, is propelled with great force, by the heart being placed so near; the same thing obtains in all the contents of the pericardium. At the same time there is in these regions a great heat, dissolving the exhaling fluid into a very penetrating vapour; whence in healthy animals there is no collection, stagnation, or corruption of this perspiring fluid. By means of this moist, warm steam constantly exhaling, the pericardium is kept loose from the heart; all concretion between them is prevented; and the whole surface of the heart, of both auricles, and of the sinuses, arteries, and veins, remains capable of motion and of extension, moist and fit to re-absorb the perspiring fluid; and at the same time the callosity and attrition of the parts, which might otherwise be apprehended from this continual motion, is obviated. And certainly, at the same time that the causes most apt to produce secretion exist here, the aptness for re-absorption is not less: For the warm exhaling vapour acts with considerable force on the whole concave surface of the pericardium and the convex surface of the heart and auricles; the veins of the heart are entirely evacuated during the systole, and hence are most apt for re-absorbing whatever was excreted by the arteries. Nor is it true, as was formerly believed, that a quantity of fluid was contained in the cavity of the pericardium, to moisten the heart, and temperate its heat; for this fluid is only found when the body is grown cold

old after death. In live animals, cut open suddenly, vapour only breaks forth; and nothing else is found, the animals are healthy, Vesalius long ago tried this experiment; and he says, "Live dogs have the cavity of the pericardium and the surface of the heart moist, and in them no quantity of water came away; although a quantity enough to be remarked (though generally but small) is found in dogs that have been some time dead &c." He seems, however, rather to incline to the opinion of those who thought that the pericardium, in its natural state, contained water, although he always speaks doubtfully of this matter. He never dissected a body, without finding water in the pericardium; but he adds, "But indeed, I generally found less water in animals lately dead, than when I delayed the dissection for a longer time." But he had also an opportunity of examining this disputed point in living men, who by dreadful sentence had their hearts cut from their bodies while they were yet alive: but he confesses, that he could not commodiously investigate this particular, although he was very near the place of execution; only he says as follows, "the pericardium seemed to have water in it." Afterwards he says, "Once at Patavia we took the heart yet beating, together with the lungs and the rest of the viscera, as soon as it was pulled out from a criminal quartered alive, and had it carried to the shop of an apothecary in the neighbourhood, and we found some water in the pericardium." Certainly near death all the fluids stagnate in the veins, the right sinus, and the right auricle; hence resorption ceases: the arteries, by their own elasticity, straiten their cavity, so that they still propel the fluids; and therefore exhalation lasts longer than re-absorption: besides, although in the instance quoted from Vesalius these viscera were immediately carried from the place of execution to a neighbouring house, they were exposed to the air in the passage, before they could be examined; whence it is easy to conceive, that the exhaling vapours might be



be so condensed, that *some water* might be found in the pericardium. And we shall see the reason why some days after death, this fluid may be found in greater quantities, if we consider, that after death the arteries are contracted more and more by their own elasticity, and the cold of the surrounding air, which acts most in the surface of the dead body; by which means the fluids are repelled towards the left ventricle: Now the valves of the aorta stop the entrance into the cavity of the heart; hence a stress is put on the coronary arteries, and through their extremities the thinnest part of the fluids is pressed into the cavity of the pericardium. But the right auricle is distended by the venous blood, repelled by the same cause: now if, in a dead body, the internal surface of the right auricle be squeezed, the external surface transudes a thin humour. Add to this, that, by the putrefaction now begun, the texture of the blood contained in the vessels of the heart is dissolved, and the blood thus attenuated escapes thro' their orifices; whence also, in dead bodies, a reddish ichor is generally found in the pericardium. These causes seem sufficient to account for our finding in this cavity, after death, a spoonful or two of a watery fluid, which is the quantity that Diemerbroeck <sup>h</sup> says he generally found in dead bodies in a natural state.

But as, from the causes now explained, the exhalation of vapour is so considerable; if the re-absorption be obstructed by any cause, a fluid will be collected in the pericardium, even in no small quantity. Nor does this disease seem to be unfrequent, as the history of physic furnishes numerous cases of this kind. Sometimes this disorder accompanies a dropsy of the breast; sometimes the pericardium alone has been found dropical <sup>i</sup>. Senac relates many cases of this nature, in his most useful treatise on the heart <sup>k</sup>.

But it is not easy to fix the diagnostic of a dropsy of the pericardium, as it has many symptoms in common with

<sup>h</sup> Anat. lib. ii. cap. 5. p. 262.

<sup>i</sup> Sinopei Parerg. Med. p. 46,—51. Barrere Observ. Anat. p. 81, 83, 86, 89, 91.

<sup>k</sup> la Structure du Cœur, liv. iv. cap. 5. Tom. II. p. 354, et seq.

With a dropsy of the chest, with disorders of the lungs and heart, &c. But a sense of oppression and straits about the fore part of the chest seems to be the most distinguishing sign, as the seat of the pericardium is there. At the same time, it is evident, that the lungs, which are so near the pericardium, must be compressed when this latter is swelled; and thus breathing will be more difficult, and the dry teasing cough will return more frequently. But as the pericardium does not only lie close upon the tendinous part of the diaphragm, but adheres firmly thereto in that part of it which answers to the lower flat part of the heart; hence, from this vicinity, the pericardium, when distended with water, will disturb the motion of the diaphragm and of the heart; whence palpitations, inequalities of the pulse, and syncope preceded by a sensation of instant suffocation as it were. Barre<sup>l</sup> enumerates symptoms of this kind in five patients, who were found, upon dissection, to have had dropsy of the pericardium; on which account he reckons as diagnostics of this disease, an oedema of the feet, a pale countenance, a small quick pulse, obstructed perspiration, difficulty of lying down in bed, together with a sensation of suffocation, recurring from time to time: however, he acknowledges, that it is difficult to distinguish a dropsy of the pericardium from a dropsy of the breast. Senac has very carefully enumerated the symptoms of this disorder<sup>m</sup>, as well from approved authors, as from his own observations; and particularly adds a sign, which seems more certain than any of the rest, *viz.* an undulatory motion perceivable between the third, fourth, and fifth ribs, when the heart palpitates. It is indeed true, that when the heart palpitates, although there be no dropsy of the pericardium, something like this is perceived; but then that kind of fluctuation, which extends itself for a considerable space, is not felt. Perhaps, however, if the pericardium be very

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<sup>l</sup> In loco modo citato.  
pp. 5. Tom. II. p. 356, et seq.

<sup>m</sup> De la Structure de Cœur. livre iv.

much distended, this fluctuation may not be so distinctly perceived.

Diemerbroek<sup>a</sup> denies that there was any palpitation in an Englishman, in whose pericardium he found two pints of water: nor does Barrere mention this symptom in his five patients; he only speaks of a small, quick pulse, such as sometimes attends a palpitation of the heart. Besides, it seems probable, that a difficulty in the motion of the heart, will be more sensible in the breast, when a large quantity of water is lodged between the ribs and the point of the heart.

Hence Senac<sup>o</sup> very prudently concludes, that the signs above enumerated, if they do not produce an absolute certainty, yet at least afford room to suspect the existence of this concealed disease.

At the same time it is easy to see, if so many and great evils follow the collection of watery serum in the pericardium, much worse are to be expected if this serum degenerates and becomes acrid, and thus perpetually stimulates that irritable viscus the heart. Vieussens<sup>p</sup> found the liquor in the pericardium to be of an alkaline nature. Barrere<sup>q</sup> found the pericardium and the surface of the heart smeared over with a matter resembling curdled milk.

A dropsy of the chest, therefore, has its seat principally in three cavities, the pericardium, and the right and left cavity of the breast: for that place of the mediastinum, in which the thymus gland is situated, is small; and I do not remember to have ever read of a dropsy seated there: and if water should be collected on the back part between the dividing lamellæ of the mediastinum, it would easily be diffused thro' the cellular membrane, as was said before.

How to proceed in the cure of a dropsy, we shall see hereafter; and §. 1231. among the general indications of the cure, this is reckoned, that “the waters effused into the cavities should be drawn from thence.” And this is to be attempted two ways: For physicians

<sup>a</sup> Anat. lib. ii. cap. 4. p. 261.

<sup>o</sup> In loco citato, p. 364.

<sup>p</sup> Ibid. p. 369.

<sup>q</sup> Observat. Anat. p. 86, et seq.



endeavour to draw off the extravasated lymph by stool, urine, sweat, &c. in which case, the fluid must first of all be absorbed by the veins, from the cavity in which it is effused: or if this has been tried without success, they make an issue for it by art, by which the collected lymph may discharge itself from the body; and afterwards they endeavour to remove the causes which produced the dropsy. We shall speak hereafter of the first method; but here we are to consider, whether a passage may be procured, and by what means. The operation performed for this end, is a puncture of the chest; and called *paracentesis*, or tapping.

It is certain, that this operation does not remove the cause of the disease: but it frees the patient from the danger of instant suffocation, and gives the physician time to attack the cause of the disease by suitable remedies. Nay, (as will be shewn hereafter), tapping frequently repeated prolongs life, and renders it more supportable, even when it is beyond the reach of art to remove the causes of the disease. Wherefore it does not seem reasonable to condemn this operation of the paracentesis of the thorax, as some who are very famous in our art have done. It is a common complaint of the surgeons, that the water cannot be drawn off without hazard of life, as Brunner<sup>r</sup> has remarked; and he was much surprised to find a person who had an empyema recover, from whom he had drawn, in three days time, twelve pints of a reddish matter; and tells of a paracentesis of the thorax being attended with a very fatal event. La Motte<sup>s</sup> positively asserts, that all dropsies of the breast are mortal, and entirely disapproves of the paracentesis. He knew, indeed, that the ancients recommended tapping for a dropsy of the breast; yet he absolutely pronounces it destructive, and that no one ever tried it with success. However, as we shall see presently, Hippocrates advises this method of drawing the water out of the breast; and from his expressions it should seem, that some persons had been preserved by it. A dropsy of the peri-

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cardium was accounted much more fatal, as it was thought that the puncture of this membrane was inevitably mortal. Nay, physicians have advised not to fatigue the patient with remedies in this disease, which they thought absolutely incurable<sup>t</sup>. It is easy to see that very little hope remains, if the collected serum has lodged long in these cavities, and macerated the vital organs; or if it be grown so acrid by length of time, as to corrode these viscera: for in such a case death, though following on the paracentesis, is not to be ascribed to that operation, but to its not having been performed soon enough, and before the serum had had time to grow acrid and taint the viscera: and, generally speaking, it is late before recourse is had to this operation; the friends of the patients, and sometimes the physicians themselves, through timidity, hesitating too long about it.

Thus we read in Peyerus<sup>u</sup>, that above three pints of an acrid muddy fluid were found in the pericardium, which fluid had corroded the substance of the heart: numerous observations evince, that the lungs are sometimes greatly injured by the like causes; as also the abdominal viscera in an ascites, of which we shall speak hereafter. Nevertheless, a paracentesis of the chest is an operation, which has been performed, both by ancient and modern physicians, with good success.

Hippocrates<sup>v</sup> has described this species of dropsy; and tells us, that it arises chiefly, when any one in hot weather, urged by vehement thirst, drinks plenty of water, and the lungs are filled and discharge the water on the breast. He says, there comes on a dry cough, the fauces grow rough; then follow shiverings, feverishness, and an orthopnoea; the body grows bulky, the feet swell: such patients, he remarks, have like symptoms with those who have an empyema; but less violent in degree, and of longer duration. He adds, that in some patients the belly, the scrotum, and

<sup>t</sup> Barrere Observat. Anat. p. 93.

<sup>u</sup> Parerg. Anat. et Medic.

p. 150, 151.

<sup>v</sup> De Morbis, lib. ii. cap. 24. Charter. Tom. VII. p. 576. et de Intern. Affect. cap. 24. Ibid. p. 655.

and the face, are swelled; but says, this only happens, if you delay the puncture too long. He bids the physician, holding his ear to the patient's side, to listen to the noise of the water fluctuating in the breast, as it heaves up and down in respiration. The words of this passage indeed are, *Si diutius aure ad latera adnota auscultaveris, intrinsecus velut acetum olet*; "If you hold your ear close to the side for a considerable time, there is a smell of vinegar within<sup>w</sup>. But the place is manifestly corrupt; for who ever hold their ear to any thing, to find out the smell of it? and from the following words, and the other<sup>x</sup> passage quoted, it is evident, the ear is to be held to the side, that we may know whether there is any water in the thorax, and in what part thereof it is lodged, to the end that it may be drawn off from thence. Next he bids us observe, whether the thorax is protuberant; then orders the incision to be made in that part which is protuberant: but if there be no protuberance, then he directs, that the patient, having drank a large quantity of some warm potion, should be laid hold on by the shoulders, and shaken, as is the custom in persons afflicted with an empyema; and when the physician is to listen, in order to discern on which side is the greatest fluctuation: when this is discovered, he orders the puncture to be performed upon the third rib from the lowest. Then he says, the rib itself must be pierced with a bore, that a small quantity of the water may be let out; then he directs, that the hole should be plugged up with raw flax, and a soft sponge be put over it, and the whole apparatus be secured with a proper bandage. A part of the water was let out every day; but on the thirteenth day, all the water which yet remained in the cavity of the breast was let out; and afterwards, if water was found to be collected anew, it was discharged in the same manner. He ordered, at the same time, drying food and warm medicines; and tells us, that scaphing is to be used boldly, if the scrotum and legs swell.



It is to be observed, however, that Hippocrates lets out the water from the breast not all at once, but at different times: for it was formerly a general rule, never to draw out the humours, which had been preternaturally collected from the larger cavities of the body, all at once. Whence we read in the aphorisms, *Those who are cauterized for a dropsy or an empyema, if the water or pus flow out all at once, die*<sup>1</sup>. Galen asserts the same thing, in his commentary on this aphorism; and supports it by the authority of Erasistratus. He at the same time cautions us, that the same danger is to be apprehended in other parts of the body, as well as in the thorax, if large abscesses are suddenly opened in such a manner as that the pus is all evacuated by one discharge; and he gives the following reason for it: *Some arteries seem to be opened, to which the pus before served as a lid or stopper; which pus being suddenly discharged, much air flies off with it, to the great detriment of the patients*<sup>2</sup>. And as a drop-sy often has for its cause a schirrhous, he feared, lest if all the water were suddenly let out from the breast, the schirrhous, perhaps, no longer supported by this fluid, should oppress the diaphragm by its weight, or some of the viscera near the thorax. This seems to be the reason why Hippocrates did not make the puncture for letting out the water in the soft parts of the thorax, which are used to coalesce again sooner; but to have bored through the ribs, that the passage might remain longer open.

It is indeed true, that the viscera, long soaked and macerated by the water floating all around them, are frequently so softened, that as soon as the equal pressure of the surrounding water is removed, the vessels are burst by the impetus of the circulating blood. But this does not happen, unless the puncture be too long delayed, and the watery serum has had time to grow acrid by long stagnation. Besides, as will be seen here-

<sup>1</sup> Qui suppurati aut hydropici uruntur, pure aut aqua confestim effluente, intereunt. *Secl. vi. Aphor. 27. Charter Tom. IX. p. 263.*

<sup>2</sup> Vasa quædam arteriosa recludi videntur, quæ prius operculi vice pus habebant; quo repente evacuato, multus spiritus cum eo excernitur, unde detrimentum ægrotantibus accidit. *Ibid.*

hereafter when we treat of the paracentesis of the abdomen, by a proper bandage the viscera may be so well sustained, while the water flows out, as to maintain an equable pressure, and then all the water may safely be drawn off at once: for there is a danger, lest, if the evacuation be made at different times, the air may find admission into the cavity, and hasten the putrefaction of the extravasated fluid.

And less danger, it should seem, is to be apprehended from evacuating the whole fluid by one operation, in a dropsy of the chest, than in the other kinds; as the lungs, before oppressed by the surrounding water, now freed from that pressure, are expanded by the air drawn in by respiration, and fill the whole cavity of the breast when it is emptied of the water: wherefore, unless the lungs be altogether decayed, the water may safely enough be drawn off all at once.

From what has been said it appears, at least, that the paracentesis of the thorax was in use among the ancient physicians; and that many persons survived after the water was drawn off. For Hippocrates expressly says, *If on the fifth day the pledget be smeared with pus, the patient generally survives; but otherwise, he is seized with thirst and a cough, and dies<sup>a</sup>.*

But the observations of the moderns also shew the utility of the paracentesis in dropsies of the breast, even in cases where there seemed to be but little hope. Du Verney<sup>b</sup> relates the case of a woman whose pulse was low and unequal, her respiration very difficult; and had not only a dropsy of the breast, but also an ascites, who was cured by the operation of the paracentesis. He first emptied the abdomen by tapping, and some days after, he pierced the thorax with a trochar, between the second and third spurious rib, as near to the spine as he could: and by this means drew off all the water with so good success, that she was immediately able to breathe freely, and in a month's

<sup>a</sup> Si quinto die linimentum pure obductum fuit, plerumque evadit; sin vero hoc non contigerit, postquam aquam exhauseris, sitis corripit ac tussis, et moritur. *De Morbis, lib. ii. Charter Tom. VII. p. 516.*

<sup>b</sup> Acad. des Sciences, l'an 1703. Mem. p. 199.

month's time returned to her employments. Bianchi<sup>c</sup> saw a paracentesis of the thorax boldly and successfully performed upon a stout young man; but he confesses, that he has not often ventured on this operation.

Nor is Bianchi alone fearful in this matter. Senac complains, that almost all physicians leave persons in this disease to their<sup>d</sup> fate; whereas his own experience convinced him of the usefulness of the paracentesis. For in a patient who had been cured of a pleurisy, there remained so great a difficulty of respiration, that he could not breathe otherwise than sitting upright; the disorder increasing so much, that he seemed in danger of suffocation: the thorax was pierced, and there came out six pints of a yellow transparent water; this discharge continued for some days, and in a month's time he was quite cured, and able to accompany the king in hunting on a swift horse. Morand<sup>e</sup> also laments, that in France, where surgery is so much cultivated, this operation was rarely performed for the cure of this disease: he had often seen the anatomy-school afloat with water, when the breasts of dead persons were opened. This celebrated surgeon, in a desperate case, drew off at once six pints of water. Towards the end of the operation a considerable quantity of pus followed, and the patient revived instantly. In a week after, the same oppression of the breast returned with insupportable violence. A passage was opened to give vent to the extravasated fluid, not by the trochar, but by an incision made in the intercostal muscles, as in an empyema. Five pints more of water came out; and towards the end, a greater quantity of pus than before; and although the patient was in danger of a marasmus, yet he recovered at last of this dangerous disease. It is to be noted, that all the water contained in the cavity of the breast was let out at each time; and although, together with the dropsy, there were manifest tokens of suppuration, yet the

<sup>c</sup> Histoir. Hepat. Tom. I. p. 662.  
 et Cœur, Tom. II. p. 366.  
 m. II. p. 347.

<sup>d</sup> Traite de la Structure  
<sup>e</sup> Mem. de l'Acad. de Chirurg.



the cure succeeded happily. At the same time it is worthy to be remarked, that so great a quantity of water lodged in the cavity of the thorax must have squeezed the lungs into a narrow space: nor, perhaps, were they afterwards fully expanded; as it is scarce possible, that the air could have entirely been barred access into the cavity of the thorax, especially when the intercostal space was divided by a pretty large incision: hence we understand how a lancet could be introduced to the length of four or five inches, without any resistance. When all the extravasated fluid is let out, and no new quantity accumulates for some days, the air contained in the cavity of the breast must be let out; and then the lungs, distended by the air taken in by inspiration, will become contiguous to the pleura, and fill up the whole cavity of the breast. By what means this is to be done, was amply explained at .304. where we treated of the cure of Wounds of the Thorax.

If physicians and surgeons have been too timid in drawing the water from the cavity of the thorax; how bold an undertaking must it seem, for any one to attempt piercing the pericardium when it is distended with water! We have already seen, indeed, that it was difficult, but yet not altogether impossible, to discover a dropsy of the pericardium, by certain diagnostics: If, therefore, we should be satisfied of the existence of the disease, and all those remedies, which will be mentioned hereafter in treating of the cure of a Dropsy, have been tried in vain, nothing remains, but either to abandon the patient to certain death, or to procure an outlet by art for the extravasated fluid. No prudent man will deny, that there are many dangers in this case: The heart may have contracted some incurable disorder, which will bring on death after the water is let out: Some fault may be concealed, which obstructs the easy resorption of the fluid exhaled from the arteries; whence, although we succeed in letting out all the water, the complaint will soon return: The pericardium has been found distended with blood, with ichor

ichor, and with air<sup>f</sup>: The heart, which is in constant motion, may be hurt by the instrument. All these difficulties have deterred from attempting the paracentesis of the pericardium: at least, I do not ever remember to have read of the performance of the operation. However, it is a generally approved rule, That a doubtful remedy is better than none. We are told<sup>g</sup> that this operation may be performed in the following manner: A hole is to be bored with a trochar, between the third and fourth rib on the left side, at two inches distance from the sternum, in such a manner that the point of the needle be directed towards the origin of the ensiform cartilage, and that the needle may pass close to the ribs; by this means, the operator will not be in danger of hurting the heart, the lungs, or the mammary artery.

At the same time it is worth observing, that physicians ought to be cautious, how they positively foretel what fluid will come out, upon piercing the thorax; especially, if inflammatory disorders have preceded. In the cases just mentioned, there was both a watery serum, and a considerable quantity of pus. Sometimes also, other vitiated humours are concealed in the cavity of the thorax. In the body of a very robust, brawny, tall man, who, on account of his great fleshiness, and the gross eatables found in his stomach, seemed in no very bad state of health before his death<sup>h</sup>, there were contained, among other things, in the right cavity of the thorax, twelve pints of a greyish fluid, which smelled like fresh liquorice-root; which smell, at first not disagreeable, grew stronger by degrees, till it became nauseous. This fluid was different from ichor, by being thinner, and more homogeneous; but was whiter and more fluid than laudable pus. Although it was five days after the man's death that the thorax was opened, this liquor shewed no signs of putrefaction: when put in a digester, it smelled sour, and separated into two parts; of which one

<sup>f</sup> Senac *Traite de la Structure du Cœur*, Tom. II. p. 353, 354.

<sup>g</sup> *Ibid.* p. 365, 366.

<sup>h</sup> Cornel. Henr. Velfe *Dissertat. Misc.* Anat. Pract. p. 304, et seq.

one was weightier than the other, subsided like curds, and was mucous and yellowish; the other was much thinner, inclining to green, and swam suspended in the first. After many days, the acrescent smell changed to a putrid, nauseous, alkaline smell. The ductus thoracicus was found, and the œsophagus uninjured all through; nor did there appear any large broken lymphatic in the thorax: but in the left cavity of the breast, there was found a great quantity of lymph, inclining to a red colour.

Many other things worthy of note were observed in the dissection of this dead body, but which do not belong to this subject. It is sufficient for our present purpose, to remark, that two so very different fluids were found in the two cavities of the heart: so that it becomes physicians to be cautious how they positively determine, what kind of fluid is contained in the thorax, lest they should afford an occasion of cavilling to malevolent or ignorant men, who often expect more from a physician than is within the reach of his art. For it is easy to see, that the different nature of the fluid affects not the method of cure; which is, To remove that which straitens the breast and oppresses the lungs, of what quality soever it be.

What is proper to be done after the water is drawn out from the thorax, will be mentioned hereafter when we come to treat of the general method of curing a dropsy.

§. 1220. **T**HE lungs have been also sometimes oppressed with hydatides, sometimes with dropfical vomicas or abscesses, from lymph extravasated and lodged in the larger sinuses. This is a disease certainly difficult to discover, and to cure, unless the remedies taken to remove some of the present symptoms should fortuitously produce a cure of this kind of dropsy.

A dropsy of the lungs themselves is a very surprising disorder, and not easily discovered. This viscus



consists of veins and arteries, and of air-vessels. But watery serum cannot be collected in veins and arteries through which the fluids are continually propelled nor in the air-vessels, because fluids lodged there would be immediately expelled by a cough; or, if that failed, the patient would be instantly suffocated. But anatomy demonstrates<sup>a</sup>, that these three kinds of vessels are united together by a cellular membrane, which has no fat in it. It is easy to demonstrate this cellular membrane, if, making a slight incision in the external membrane of the lungs, and cautiously passing a small tube between the lobes that lie close by each other, air be blown in; for then all the lungs swell, and the air pervades all the conjunctions of the vesicles and vessels, and thus this cellular membrane is filled and rendered conspicuous. But it appears much more distinct, if, after injecting the blood-vessels with wax, the lungs are inflated with air and dried: for then, if a small portion of the lungs thus prepared be viewed through a microscope, one discerns the folliculi Malpighiani, on the membranes whereof innumerable vessels are distributed; and besides these, it evidently appears that the spaces left between these folliculi contain a cellular membrane, over which also are dispersed a prodigious number of small vessels. I have preparations of this kind in my possession, which plainly demonstrate this. In this cellular membrane extravasated lymph may be collected, as well as in any other parts of the body, and produce a real dropsy of the lungs, whenever the subtle steam, which the arteries perpetually exhale, ceases to be entirely taken back into the blood by the absorbent veins, by whatever cause this is occasioned. Now the lymph thus distending the cellular membrane may form tumours of various sizes, watery vomica, and hydatides, and by compressing the adjacent vessels, and particularly the membranous extremities of the bronchia, disturb the action of the lungs in various manners. Nor will this seem strange, if we consider that purulent vomicae are formed in this very cellular membrane.

Hip-

<sup>a</sup> Kaau Perspir. dict. Hippocr. p. 64.

Hippocrates<sup>b</sup> seems to have described this disease : We mentioned the passage of Hippocrates's works to which we refer, in the preceding paragraph. It was here remarked, that he directs the physician to put his ear to the patient's sides, to find by the noise of the fluctuating water where it was lodged ; he says then, *intrinsecus velut acetum olet*, " it smells within like vinegar : " This undoubtedly is nonsense ; but Cornarius reads, instead of ( $\sigma\zeta\epsilon\iota$ ) it *smells*, ( $\zeta\epsilon\iota$ ) it *boils*. Before, when we treated of the peripneumony, §. 848. we said, that a noise resembling the hissing of boiling water in a kettle covered with the lid was accounted a very bad symptom, which hissing noise the physicians call the " wheezing of the lungs." At the same time it was noted, that this happened principally when the blood-vessels being obstructed and distended compressed the bronchia, whence the free passage of the air was impeded, and the collected frothy mucus agitated together with the air in the lungs, not easily cleared away, causes this disagreeable noise. But what I would principally observe at present is, that when a passage from Hippocrates's prognostics was quoted, in which the very word  $\zeta\epsilon\iota$  occurs, when *pulmo plenus in gutture fervet*, " the full lungs boil in the breast." Now when wine by the second fermentation turns to vinegar, a like noise is heard in the casks. This will help us to understand the passage now mentioned, which, without the emendation proposed by Cornarius, is absolutely unintelligible.

But that Hippocrates has in his eye a dropsy of the lungs, is plain from what immediately follows. *Et aliquamdiu his afficitur ; sed postea in ventrem* ( $\pi\rho\sigma\ \pi\eta\nu\ \kappa\omicron\iota\lambda\iota\nu$ ) *trumpit, confestimque sanus, et morbo liberatus videtur* : " And for some time the patient labours under these complaints ; but afterwards it passes to the thorax, and he presently seems recovered and free from the disease." For if the cellular membrane of the lungs be filled with watery serum, or this serum have formed a large hydatid tumour, great oppression in the breathing follows from the bronchia being compress-

ed, as also a dry cough, &c. But as soon as this watery tumour bursts, and discharges its lymph into the cavity of the thorax, all these symptoms cease, the dropfy of the lungs being converted into a dropfy of the thorax: and that Hippocrates, by the word *κοιλιν*, *i. e. hollow*, which sometimes signifies the belly, meant here the cavity of the thorax, is evident; because he soon after calls the abdomen, not simply *κοιλιν*, but *κοιλιν την κατω*, the lower cavity, or *γαστρα*, the belly.

But he speaks still more plainly of these cases elsewhere: *This (the dropfy) is produced also when tubercles are formed in the lungs; and these tumours being distended, burst into the breast. And that a dropfy is sometimes caused by these tumours, oxen, dogs, and swine, afford a proof: for tubercles of the lungs are principally formed in these quadrupeds, which tumours are full of water; and this you will find on cutting them, for then the water will flow out: and such tubercles are more likely to be formed in us than in quadrupeds, as our diet is less regular.*<sup>c</sup>

On another occasion, at §. 1062. I observed, that Ruysch, in three bodies of persons who had been afflicted with an asthma before their death, found in the lungs a collection of transparent bladders distended with air, from whence he could not expel the air by a slight compression; nor had the air blown in by the aspera arteria any communication with that in these distended bladders, which, being pierced with a needle, let out the air and subsided. I endeavoured to give the reason of this, namely, That, the mesochondriac muscles having become paralytic, the extremities of the bronchia remained distended with air, the ramifications of the aspera arteria which belonged to these vesicles having grown together by some cause or other.

<sup>c</sup> Gignitur etiam, ubi tubercula in pulmone exorta fuerint, et aqua repleta in pectus eruperint. Quod autem a tuberculis oriatur hydrops, mihi argumento sunt boves, canes, et fues. In his enim quadrupedibus maxime pulmonis tubercula oriuntur, quæ aquam continent. Sectione namque facta, citissime cognoveris, nam aqua effluet. Talia autem multo magis etiam in homine quam in pecoribus fieri videntur, quanto morbo magis etiam vicius ratione utimur. *De Intern. Affect. cap. 24. Charter. Tom. VII. p. 656.*



her. But perhaps it will appear more likely, that the cellular membrane of the lungs was distended with air, so that a kind of emphysema of the lungs was produced, which compressed the air-bladders, and thus impeded respiration. Then we easily see, why air blown into the aspera arteria did not penetrate these cells; as also why, when the air was violently impelled into the aspera arteria, some of these bladders were burst. The air contained in our fluids being disengaged from them might, as was said in the chapter of Flatulencies, distend the cellular membrane of the lungs, or pass into it from the ruptured or corroded extremities of the bronchia: but when once the air had gained entrance into the cellular membrane, it could not so easily be expelled by the same way by which it was admitted there; as was observed before, when we spoke of the emphysema which sometimes follows wounds of the head, and more particularly of the thorax. And Ruysch had good reason to believe, that this was a more frequent cause of asthma than is generally imagined.

Albertini<sup>d</sup> observed such an oedema of the lungs; and made it a diagnostic, if, together with an oedema of the external parts just beginning, a difficulty of breathing presently comes on: for reason teaches, and the testimony of Hippocrates quoted above confirms it, that respiration will be more impeded by a small quantity of serum collected in the interstices of the lungs themselves, than by a much greater quantity extravasated into the cavity of the thorax. Albertini further remarks, that serum collected in the lungs is more easily carried off, than when it is extravasated and lodged in the cavity of the breast: for he had seen many patients, who from various causes suddenly swelled all over, and especially in the extreme parts, attended with a great difficulty of breathing; who yet recovered by the use of gentle hydragogues, diuretics, &c. From whence he concluded, that their asthmatical complaints took their rise from an oedema of the lungs. It is a remarkable observation of Dr Sim-

son<sup>e</sup>, that he always suspected an oedema, or dropical swelling of the lungs, if either the face was turgid, or there was ever so small a swelling about the ankles, and at the same time a difficulty of breathing; especially if the pulse was also so suppressed, that it could scarce be felt. He happily cured a woman, who seemed in danger of instant suffocation, by giving her calomel. Certainly, if we consider that the veins of the lungs are most freely emptied during the diastole of the heart, and that there is a great heat and a quick circulation of the fluids here, there seems to be a good prospect of the extravasated fluid being re-absorbed; especially if in the beginning of the disease hydragogues are prudently administered: hence Albertini observed diuretics, purging, and even bleeding, to be of service. But he confesses, that tho' he found by dissection that this is sometimes the seat of a drop-sy, yet it was but seldom; partly, because it is more easily cured than the other kinds; and partly because, if the disease be obstinate, it is easily converted, by the bursting of the watery vomica, into a drop-sy of the chest.

Maloc<sup>t</sup> <sup>f</sup> relates a curious history of this disease. A soldier was afflicted with a very severe asthma, attended with a slow fever. He could neither lie on his back, or either side, without the greatest uneasiness, and was therefore obliged to keep in an erect posture. His arms, hands, legs, and feet, were oedematous; hence this excellent physician suspected a drop-sy of the chest; but finding no fluctuation, nor the patient himself ever perceiving any thing like it, and as there were no other symptoms which usually attend this disease, he changed his opinion. The poor man, after languishing for two years, died. Upon opening his body, no extravasated serum was found in the thorax, but a watery vomica in each lobe of the lungs, which contained about six ounces of transparent serum inclosed in a particular kind of cyst, whose sides were about a line in thickness, and com-

posed

<sup>e</sup> Medical Essays, Vol. V. Part ii. p. 627, 628.  
 Sciences, l'an 1732. Mem. p. 350, et seq.

<sup>f</sup> Acad. des

posed of different lamellæ lying one upon another, in which there was not the least appearance of either fibre, vessel, or gland; yet they could bear to be stretched lengthwise, and contract themselves again by their own elasticity: but being roughly handled by the fingers, they became a perfect mucus. It is likewise judiciously observed, that the extravasated serum was not lodged in the bronchia, but in the cellular membrane which fills up the spaces between the greater and smaller lobes of the lungs.

This observation confirms the diagnosis mentioned above: for in this case the extremities of the body were oedematous, the symptoms of a dropsy of the thorax did not appear, and a great difficulty of breathing was caused by a few ounces of limpid serum.

Malocet seems to think, that the lamellated membranes which formed these cysts, were not of an organical structure, but formed from the contained fluid, as neither fibres nor vessels were visible in them. Very great anatomists have been of opinion that the substance of the cellular membrane is not properly vascular, at least that vessels had not yet been demonstrated in this part; but numerous vessels are distributed all over this coat, which envelops the vessels dispersed through the viscera, and every where accompanies them. It is well known to those who have cultivated the more subtle anatomy, that, after the most successful injections, something remains not filled with the matter of the injection in the structure of the viscera; which, unless it be removed by maceration, or some other management, obscures the neatness of the preparation. This seems principally to depend on the cellular membrane. The reader may consult on this subject Haller<sup>s</sup>, where he treats of the cellular membrane. I have in my possession such kinds of anatomical preparations; which (the whole cellular membrane being removed) exhibit to the sight, assisted by the microscope, the wonderful course of the vessels in each of the viscera. It does not therefore seem impossible, that the cellular membrane may



sometimes form a cyst, in which the accumulated lymph lodges: besides, we know that membranes, preternaturally distended, do not always grow thin, but sometimes become thicker. Purulent vomicae of the lungs seem also to lodge in this cellular tunic, which is all over the body the seat of inflammatory tumours, and of the consequent suppurations: now these vomicae have often been found to have thick, and even considerably solid sides.

Barrere<sup>h</sup> declares, that in dissecting he has found an oedema of the lungs; and once also, in the concave part of the right lobe of the lungs, he found two bladders full of air, of which one was as big as the thumb, and the other as a hen's egg. Storck<sup>i</sup> saw an emphysema of the whole lungs.

But a dropfy of the lungs may end three different ways: For either the extravasated serum, being re-absorbed, may be evacuated from the body by the common emunctories, and thus the lungs be relieved, as was said before: or the dropfical tumour may burst into the cavity of the breast, and produce a dropfy of the chest: or it may pour its contained lymph into the bronchia, and be thrown out by a cough; in which case there is the same danger as in a purulent vomica, that is, lest the bronchia be overwhelmed at once by a sudden discharge, and the patient suffocated.

If the extravasated serum can be thrown up by coughing, and has not acquired any great degree of acrimony, there is more hope of a cure than in a purulent vomica, of which however many recover. Two medical observations confirm this<sup>k</sup>.—A nobleman sixty years old, four years after a catarrh, which had been neglected, was seized with an asthma, attended with a very troublesome cough at intervals. He had a difficulty in his speech, and once his legs swelled for some days. While he was one day lifting up his right arm, he felt as though something burst in his breast; and presently, with a violent cough, he threw up four pints of a matter like the white of an egg, with-

<sup>h</sup> Observ. Anat. p. 109, et seq.    <sup>i</sup> Ann. Med. p. 118.    <sup>k</sup> Targioni Tozzetti prima raccolta di Osservaz. Mediche, p. 83, et seq.

without taste or smell, and all this within three quarters of an hour. When he had rested himself a little in bed he found himself better, and his pulse was good.—When a happy consequence was expected from this, the same discharge returned ten hours afterwards, and he threw up three pints of a like matter in twenty minutes: but he was not relieved by this discharge; the oppression on his breast increased, his strength sunk, and soon after he died suffocated. It is probable there were here two vomica.—A robust youth, after a pleurisy, complained of a slight oppression and a weight near the place where the pain had been. Forty days after, he felt on a sudden something burst in his breast. A great oppression soon followed, with a most violent cough. Within an hour after, he threw up four pints of matter like that of the former case, and recovered.

If there were a suspicion of such a disease, the same things might be tried as were recommended at §. 857. for promoting the rupture of a purulent vomica. Certainly, in the last of the above cases, one should rather have expected an abscess. However, whether pus, or extravasated serum, be lodged in the lungs, we should endeavour to draw it out.

§. 1221. **A**ND even the aspera arteria, on its anterior and conspicuous part, when lymph, from whatsoever cause, is collected and stagnates therein, often produces a species of the bronchocele. This disorder is easily known; and is cured, as authors tell us, by puncture, and by the use of discutients and revellents.

Tumours frequently appear in the fore part of the trachea, and those too of a considerable size, which, as they are thought to arise from violent straining, loud crying, or the struggles of a woman in labour, have been reckoned a kind of hernia, or rupture, and distinguished by the name of a bronchocele. The thyroid gland is imagined to be the seat of these tumours.

Mr Lalouette <sup>a</sup> has taken great pains in examining the structure and use of this gland, both in the human body and in brutes. He found the internal structure to consist of innumerable, round, transparent corpuscles; from which there flowed, upon incision, a yellow humour of a very viscid nature, but yet soon disappeared. After making a slight wound with the point of a lancet, he blew in air through a pipe, on which the thyroid gland swelled considerably, and he plainly saw these small round bodies rise and swell; but when he blew into the arteries or veins, they did not swell. A child-bearing woman, holding in her breath strongly in violent labour-pains, had the left side of the thyroid gland considerably swelled; which swelling, upon opening the body, was found to contain air only, and a few drops of a thin yellow fluid. Whence it is probable, that the air retained in the *aspera arteria* found a way into the substance of this gland, by the woman's violent efforts in labour. As therefore considerable arteries tend to this gland, and veins return therefrom, and it consists of innumerable round, hollow, small bodies, containing a fluid, all this apparatus seems to be designed for the secretion of some humour; which, if when it is collected in these round follicles it be hindered from being evacuated, may distend them more and more by degrees, and produce considerable swellings.

However, that such tumours in these parts are not formed solely in the thyroid gland, is plain from the two cases related at §. 792.

Such watery tumours are easily known, and, if they are not very large, may be dissolved by friction, by fomenting with camphorated spirits, and by hydragogue purges properly administered. Decoctions of briony, with wine and a little sal ammoniac, or the root alone bruised to a pulp, has often been of service. If these tumours are large, and do not yield to these remedies, they may be safely opened; when, for the most part, they discharge a pellucid, viscid liquor, resembling the  
white

<sup>a</sup> Mem. de Mathem. et Physiq. presentes a l'Acad. Tom. I. p. 160.

<sup>b</sup> Ibid. p. 169.



white of an egg. To prevent a return of the complaint, the sides of the emptied bag may be so irritated, by strong, suppurating, and corrosive applications, as to suppurate and grow together. Of which hereafter, when we treat of the cure of an hydrocele.

1222. **T**HE follicle of any gland may be the seat of the like disorder, and may be cured by the same method.

There is, perhaps, scarce any part of the body where tumours of this kind may not arise, when either the follicle of a gland, or the cells of the membrana adiposa are distended with watery serum. There is not a cavity in the body, great or small, that does not exhale and absorb some humour; if, therefore, from any cause, this exhalation and absorption is obstructed, such a watery swelling may be produced. I once saw (as I mentioned at §. 796.) such a swelling of considerable size, under the tongue, happily removed by puncture. I have sometimes observed such hydatides formed in the edges of the eye-lids, and in the cornea itself. A viscid lymph of this kind is frequently enough collected in the joint of the knee; which, however, if attended to in the beginning, is generally to be dissipated by suitable remedies. La Motte<sup>a</sup> saw a tumour of this kind, formed in one night, not very painful, and in which he perceived a manifest fluctuation: however, within a few days, by the use of aromatics and wine, it was happily removed. It is easy to deduce the cure of like swellings in various parts of the body, from what has just been said; as also from what will be mentioned hereafter, in treating of the Cure of the dropsy.

1223. **A** VERY remarkable kind of dropsy also arises frequently in the ovaria of women; but chiefly in those who are barren, and advanced in years. It is with great difficulty known,

<sup>a</sup> Traite Complet de Chirurg. Tom. II. p. 209.

known, but from dissection; is never cured, and often turns to an ascites.

The ovaries are situated on each side of the bottom of the uterus; and, being joined to the womb by short round ligament, are lodged within the duplication of the broad ligament, and are frequently distended by a dropical swelling. Numerous cases of this kind occur every where, in the writings of the authors and collectors of medical observations. In the bloom of life, the ovaries are plump and turgid; and many transparent vesicles bunch out from their surface, which are called the *ova*. In elderly women, they are often so decreased in size, that scarce any traces of them remain. There is, perhaps, no part of the body which so often swells out into atheromatous, steatomatous, and dropical tumours, and in which such strange concretions have been found. Anatomists have found in the ovaries, stones, hairs, teeth, bones, and frequently large hydatides, inclosed in peculiar membranes, and sometimes of a prodigious size.

But although this disease most frequently attacks barren and elderly women; yet sometimes, it is certain, fruitful women have been subject to it, even in the prime of life.

Dr Douglas<sup>a</sup>, dissecting the body of a woman of twenty-seven years old, who had died the third day after her lying-in, found the whole left ovary changed into a large hydatid, which filled the whole cavity of the abdomen, compressed all the abdominal viscera, and contained above seventy pints of a viscid dark coloured humour, almost of the consistence of a syrup. In the sack itself, which inclosed the humour, he found many small bladders of different sizes, distinct from each other, and containing a pellucid viscid humour, like mucilage of quince-seeds, and coagulating with heat like the white of an egg. This tumour grew to this prodigious size in the space of three years; and arose from a violent blow on the left side of the abdomen,

<sup>a</sup> Philosophical Transactions, n<sup>o</sup> 308. p. 2317. and Philosophical Transactions abridged, Vol. V. p. 290.

en, not long after the birth of her first child. She felt great pain from the blow, which, however, went off in three days. Two months after, she felt some slight pains in the hypogastric region, on the left side, which began also to swell. The pains increased more and more, till she became pregnant, during which she perceived no unusual uneasiness, only the abdomen was more swelled than in common, and scarcely subsided at all after delivery. In a year after, she became pregnant again; and about the middle of that time, her legs began suddenly to swell; and if they were rubbed, discharged a considerable quantity of water; and also the skin of the abdomen, especially if the small pimples on the skin happened to be scratched. There came on then a difficulty of breathing, and a palpitation of the heart; and she could not sleep, except in an erect posture, for fear of suffocation. However, she bore a living child; but an extreme weakness and difficulty of breathing succeeded the delivery, and she died on the third day. But as each cavity of the thorax contained a large quantity of reddish water, and the pericardium was full of a greenish liquor, Dr Douglas thought this might be the chief cause of her death; and that otherwise she might have lived many years, the other abdominal viscera being in a sound state.

We read <sup>b</sup> of a virgin, who was attacked with this disease at thirty, and lived to be eighty-eight years old: on dissection, the swelling was found to fill all the abdomen, except the pelvis.

Whether, in a dropical swelling of the ovary, is not the fluid more frequently found of a dark dirty colour, than in an ascites? Certainly, many observations seem to shew this. In the case just mentioned, there was found a viscid dark-coloured liquor. In another like case, after death, there were drawn off forty-two pints of a fluid, without any smell, which resembled coffee in colour and consistence <sup>c</sup>. Antonio Benevoli<sup>d</sup>, shewing

<sup>b</sup> Mem. de l'Acad. de Chirurg. Tom. II. p. 458.  
Mémoires, l'an 1739. Hist. p. 22.

<sup>c</sup> Acad. des  
<sup>d</sup> Differtazioni, &c.



ing his scholars the operation of the paracentesis on two dead bodies, evacuated from one of them a large quantity of water tolerably clear; from the other issued a dark-coloured liquor: at which being surpris'd, he immediately dissected the abdomen, and at first first thought all the contents were putrified: he caus'd the cavity to be wash'd out with clean water; and then he saw floating in the water, a large hollow membrane of a black colour, under which lay conceal'd the intestines, and the other abdominal viscera, sound, and quite of a natural colour: after a careful examination it appear'd, that this vast bag had its origin in the left ovary: on the internal surface of this bag were also found some tumours, as big as an egg, and even larger. The observations of professor Morand<sup>e</sup> also convince, that these tumours contain a matter like lees, and sometimes of a gelatinous consistence, as I have also seen.

Sometimes such dropfical swellings grow to a vast size, so as to fill the whole cavity of the abdomen, and then they cannot easily be distinguished from an ascites: but a dropsy of the ovarium may be easily known in its beginning, from its situation in one or other side of the hypogastric region, and from the circumscribed limit of the tumour. An obtuse pain, and a kind of weight, is also perceived in the part affected. Women bear this complaint a long time without remarkable injury to their health. They conceive, bear children, and the abdominal viscera perform all their functions, as they are not soaked in water, as in an ascites. To these symptoms, a celebrated physician<sup>s</sup> adds, a swelling of the leg on the same side with the tumour, and frequent oozing of water through the pores: nay, he almost reckons this a pathognomonic symptom; and indeed, in the case above recited, Dr Douglas observ'd the same thing.

Nevertheless, the true state of the dropsy may still be doubtful; for the same disorder has been observ'd in the Fallopian tubes; under which complaint an un-

<sup>e</sup> Acad. de Chirurg. Toron. II. p. 458.    <sup>f</sup> Ibid. p. 457.    <sup>g</sup> Morgagni Tozzette Osservaz. Mediche, p. 37, 75.

happy virgin laboured, in whose body, although the abdomen was amazingly distended, no water was found in the cavity of the belly; but 124 pints of limpid water, of a brackish taste, were contained in the right Fallopian tube: the ovary was of a middling size only, and half of it putrefied. No one certainly could distinguish, in the beginning of such a disorder, whether this tumour was in the ovary, or in the Fallopian tube; however, there is no great diversity in the cure, which soever of these be the seat of the dropsy. As the membranes of such a dropfical neck have often been found very thick, it is more difficult to perceive the fluctuation of the water, than if were contained in the cavity of the abdomen.

It is evident, that a dropfical tumour of the ovary may, by bursting its inclosing membranes, let out the contained water into the cavity of the abdomen, and thus be converted into an ascites; although this seems rarely to happen, as we read so many instances of prodigious watery tumours in the ovaries found unbroken in dissection. A like method of cure may be pursued, as will be mentioned hereafter in the general treatment of a dropsy: but it is obvious, that the cure will be difficult, as the disorder often lies concealed, in the beginning of the disease, a long time before it can be well distinguished; and is scarce ever certainly known, till the swelling is grown to a considerable size. If now it should be true, as Ruyfch<sup>k</sup> affirms, that these dropfies of the ovary are mostly, if not always, a dilated ova, they must most prodigiously exceed their natural magnitude before the disease can be known: and as the principal hope of curing a dropsy is built on this, that the collected lymph, being reformed by the veins, may be expelled from the body by urine, stool, or sweat, it is easy to see, that such reformation can scarce be expected, when the inclosing membranes are so much dilated, and the veins dispersed through them entirely compressed, by the distending water: hence such tumours proceed to

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<sup>i</sup> Bonet. Sepulcret. Anat. Tom. II. p. 491.  
 chirurg. obl. 17. p. 17.

<sup>k</sup> Observat. Anat.

grow, till sometimes they arrive at an almost incredible size. Add to this, that sometimes a schirrhous accompanies this complaint, which increases the difficulty of the cure<sup>1</sup>. In one instance, each ovary was found schirrhous, so that one weighed fifteen, and the other twelve pounds; their internal substance appeared, as it were, glandular, and contained several hydatides of various sizes. Sometimes a gelatinous substance is contained in this kind of tumour<sup>m</sup>, which cannot be discharged by means of the trocart; whence it has been necessary to dilate the wound, that this thick fluid might find a passage: but putrefaction is soon consequent on the accession of air; and part of the contained fluid, escaping into the abdomen, is corrupted, and occasions death. A case is related, in which, although at different times, sixty-seven pints of a gelatinous fluid were let out, yet a considerable quantity of it was found in the cavity of the abdomen after death.

Is, therefore, a dropsy of the ovaries to be accounted an absolutely incurable disease? There is related in the Philosophical Transactions, a<sup>n</sup> case, where all the symptoms seem to shew, that the left ovary was the seat of a dropsy; and in thirteen years time swelled prodigiously. As the tumour swelled to a point, Dr Houstoun complied with the intreaties of the unhappy woman, and inflicted a wound at the top of the swelling, of an inch in length. As nothing issued from it, he dilated the wound: a viscid gelatinous substance came out first, and afterwards a vast quantity of such matter as is wont to be contained in a steatoma or atheroma; together with several hydatides of several sizes, some of which were bigger than an orange. All the contents being discharged, he closed the wound by suture; and pursuing a proper method of cure, the patient quite recovered.

But as sometimes such tumours do not adhere by a very thick root to the ovary, and have been found not at all adhering to the rest of the viscera, very famous surgeons have

<sup>1</sup> Académ. de Chirurg. Tom. II. p. 456.  
 \* N<sup>o</sup> 381.

<sup>m</sup> Ibid. p. 452.



have begun to think of extirpating the diseased ovary. It is certain, that the ovary may be cut out of animals, without loss of life: and we read, that this has been attempted on the human species, and that once this fell out by accident<sup>o</sup>. When the disease has not got to a great height, and while there is but little apprehension of the tumour's adhering to the neighbouring parts, it does not seem altogether impossible that such an operation might be attempted with some hopes of success.

In the mean time it is certain, that the paracentesis is equally safe for a dropsy of the ovary, as for an ascites: and by this means, life at least may be prolonged for many years, and the patient greatly relieved, although perfect recovery should not be obtained. Professor Morand<sup>p</sup> asserts, that he several times performed this operation on a lady of quality, who suffered so little from it, that she frequently went into the country the day after the operation, although generally eighteen pints of water were drawn out: nor did she die at last of a dropsy, but of some other disease.

§. 1224. **A**ND even in the cavity of the uterus, when its internal orifice is closed up, there is often so great a quantity of water collected, that the whole abdomen seems to swell, as in an ascites. This disease is also difficult to be distinguished, on account of the symptoms resembling those of pregnancy. It is cured by relaxing the orifice of the uterus by fomentations, steams, and by the use of uterine medicines.

As the womb is hollow, the mouths of its arteries exhale a subtle lymph, which may either be discharged by the mouth of the womb, or if that be closed so as to refuse a passage to it, it will be re-absorbed by

the veins, which are numerous here, and sufficiently open. Of Tabarrani, a celebrated anatomist, we read<sup>a</sup>, that, "while he was blowing air into any one of the hypogastric arteries or veins, all of the rest on either side being bound up, he saw the anastomosis, or mutual communication, which the veins and arteries on one side of the womb, maintain with the respective corresponding vessels of the other side, and also with the spermatic vessels themselves." And not only this, but he saw, that the uterus itself, and the vagina, were inflated by this means: and, on the other hand, he saw, that when air was blown through the orifice of the vagina, the veins belonging to the uterus, vagina, and ovary, were inflated and swelled up with air. So that there is a very free entrance of the exhaled fluid into the veins, and consequently resorption is easy here. Besides, if serum be collected in the cavity of the womb, it may easily flow out by the mouth of the uterus, unless that be closed, or the vagina preternaturally concreted; which, as it can but rarely happen, we see the reason why a uterine dropsy is but seldom known.

But as the mouth of the uterus is closed during pregnancy, if any lymph be then collected in the cavity of the womb, an outlet is denied to it. It is indeed true, that when the fœtus is grown to any considerable bulk, the chorion adheres every where to the internal surface of the womb by the cellular membrane, and fills the whole cavity: but in the beginning of pregnancy, the fœtus, with its membranes and their inclosed fluids, is much less than the womb, and during this time lymph may be collected there: besides, after that the outward surface of the chorion touches the inside of the womb, and every where adheres to it, the cellular membrane, which connects them, may break in some part, or by some means be detached from the womb; and then the extravasated fluid may be collected between the outer surface of the chorion, and the inner surface of the womb.

In the mean time, it is plain that the os uteri must be

<sup>a</sup> Observat. Anatom. n<sup>o</sup> 39. p. 77.

be closed, or the sides of the vagina grow together, to form a dropfy of the womb; hence also we ought to consider this disease as affecting pregnant women, or those who are not.

Hildanus<sup>b</sup> observed a dropfy of the womb in his wife while she was pregnant. From the very beginning of her pregnancy, she had been weaker than was usual with her formerly in that state. Her belly, in the course of it, swelled to so monstrous a size, that every one thought she would bring forth several children. Six weeks before delivery, her legs and feet swelled, as is common in dropfical cases. She suffered extreme pain for a long time. At last, after having had labour pains for two days, the pain suddenly increasing, the os uteri opened, and eighteen pints of clear water, without the least tincture of blood, flowed out. After she had rested half an hour, and been strengthened by a cordial, the waters, which properly belong to the membranes inclosing the foetus, came away, to the quantity of nine pints; and she bore a boy in perfect health, and stronger than the children she had borne before. She herself was well in a month's time; suckled this child, and reared it happily. She was afterwards pregnant again, and in tolerable good health all the time of her pregnancy. It seems very probable, that those first eighteen pints of clear water were preternaturally collected, and not inclosed in the membranes which involve the foetus, as the waters contained in them are seldom found so transparent. Mauriceau<sup>c</sup> found in a woman, who had discharged upwards of three pints of water from the womb a month before delivery, the membranes, which involve the foetus, entire; and was obliged to break them, in order to free the dead child.

It seems, however, very probable, that the fluid naturally contained in the amnion may sometimes be increased to a very unusual quantity. Thus it is often observed, that the bellies of pregnant women are greatly swelled, so that they imagine they shall bring

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<sup>b</sup> Oper. omn. Observat. cent. 2. p. 228, 129.  
*Maladies des Femmes grosses, Tom. I. p. 173.*

<sup>c</sup> *Traite des Maladies des Femmes grosses, Tom. I. p. 173.*



forth more children than one; whereas, when their time is out, one child only is born, and that not of an unusual size, but a vast quantity of water comes away when the membranes are burst: such children are often weaker than others, and, after languishing a short time, die. A woman who had several children, when she was eight months gone with child, was exceeding big, and the size of the abdomen increased considerably in the last week of pregnancy: when the membranes burst, about fifty pints of water came away; after which the man-midwife delivered her of twins, one of which was dead, and the other lived but sixty-four hours: neither of them had more than half the bulk of a child born at eight months end. But the mother was out of all danger in twelve days after the delivery <sup>d</sup>.

This disease was known to Hippocrates, and he makes mention of it in several places, and says, that the woman will recover, if she goes out her time; for “that the water collected before will be carried off together with the usual child-bed discharge <sup>e</sup>.” The instances above recited confirm the judgment of Hippocrates.

But it sometimes happens, that a dropsy of the womb ensues upon a miscarriage; especially if the placenta has been left behind, which has often been observed to degenerate into a mass of hydatides.

Ruyſch <sup>f</sup> observed, that the abdomen in some women was distended to a vast size from this cause; which distension was accompanied with a great difficulty of breathing, an oedema of the feet, a loss of appetite, an oppression on the præcordia, fainting, and paleness. In another place <sup>g</sup> he tells us, he has often found, that when the placenta was left in the womb, it degenerated into limpid hydatides, either in whole or in part. Tulpius <sup>h</sup> observed the like appearances in a woman, who having been for some time afflicted with an inordinate flux of the menses, at last brought

<sup>d</sup> Essays and Observations, physical and literary, Vol. II. p. 342.

<sup>e</sup> De Natura Muliebri, cap. 2. Charter. Tom. VII. p. 682. et cap. 36. Ibid. p. 707.

<sup>f</sup> Observat. Anat. Chirurg. n<sup>o</sup>. 23. p. 25.

<sup>g</sup> Ibid.

obs. 33. p. 34.

<sup>h</sup> Observat. Medic. lib. iii. cap. 22. p. 238.

brought forth a mass, containing innumerable bladders, some filled with a saffron-coloured water, and some only with air: these were not, indeed, discharged all at once, but at separate times, so as that all together they would easily have filled a common water-pail, which would contain sixteen pints of water, or more: after these were discharged, so much blood and water came away, that she fainted several times. He saw a case of the like kind in another woman, who as well as the first soon recovered her former health: nor did the womb appear to be injured, as they both happily brought forth children. Hippocrates also seems to have known this to be sometimes the cause of a dropsy of the womb; for thus he speaks: *If a dropsy be formed in the womb, the menses decrease in quantity, and are worse in quality; afterwards they suddenly cease, the belly swells, the breasts grow dry, and the woman is otherwise indisposed, and feels to herself to be with child; but the mouth of the womb affords a symptom in this case, for it seems slender if touched: a fever and dropsy afflict the patient, and in process of time a pain is felt in the lower belly, the loins, and flanks. This disease principally arises from abortion, although it sometimes springs from other causes*<sup>i</sup>. He has a like observation<sup>k</sup> also in another passage.

But observation likewise shews, that water is sometimes collected in the womb when it is not pregnant; and that in a very great quantity, if the mouth of the womb be obstructed or concreted, so as not to afford an issue for the water: and as many of the signs of pregnancy are the consequence of the distension of the womb, it is no wonder that the womb, being distended by a dropsy, should sometimes deceive even skilful persons, with a false shew of pregnancy. Sometimes,

<sup>i</sup> Si hydrops in uteris oboriatur, menses pauciores ac deteriores fiunt, inde repente deficient, venter intumescit, mammae siccae evadunt, et in reliquis male habet, sibi que utero gestare videtur. Sed et in uterorum ostulo significat; tangentibus enim gracile apparet; et febris et aqua ipsam corripit, quoque longius tempus processerit, dolor inum ventrem, lumbos, et illa, detinet. Hic morbus ex abortu maxime oritur; et ex alijs etiam accidit. *De Natura Muliebris, cap. 2. Charter. Tom VII. p. 682.*

<sup>k</sup> Ibid. cap. 36. *ibid.* p. 707. et *ibid.* cap. 59. *ibid.* 761.

times, also, water collected in the womb is discharged from thence at stated times, the mouth of the womb being opened, and is collected afresh. Thus we read in Fernelius: “ A certain woman, who had  
 “ this disease always on the approach of her courses  
 “ discharged all the collected water through the neck  
 “ of the womb, so as to fill six or eight basons with  
 “ a very hot water; the menses then followed regularly. An equal quantity of water was collected in  
 “ the succeeding month, and at the stated time was  
 “ discharged as before. This woman was afterwards  
 “ perfectly cured, became pregnant, and bore a living child<sup>1</sup>.” Every day, for some months, a very limpid water issued by drops from the womb of a lady of quality of Berlin, in such a quantity, as in twenty-four hours sometimes to amount to a pint; at last she died, quite wasted, of a fever. On dissection, the uterus was found in great part scirrhus, and the vessels of it in part stuffed up with polypuses *m*. But in both the instances we have mentioned, the mouth of the womb being open, left an issue for the collected lymph. But as it appears also, from these observations, that a very large quantity of water may be collected in a little time in the cavity of the womb, if the mouth, being any ways closed, hinders a discharge; we may the less wonder, that Vesalius should assert, that he saw, in the womb of a dead body, above 180 pints of serous watery matter; “ no water in the  
 “ mean time being found about the intestines, or any  
 “ lax tumour in the hands or feet; nor were any of  
 “ the viscera, or any other organ, unsound; except  
 “ that this prodigious womb, whose bottom was  
 “ grown wonderfully callous, adhered to the peritonæum before, and the glands of the right ovary  
 “ were so amazingly increased in size, that it seemed  
 “ as if nine or ten eggs of geese, or rather of ostriches, were inclosed in one membrane, each of  
 “ which were stuffed with a liquid like the white of  
 “ air

<sup>1</sup> Pathol. lib. vi. cap. 15. parte ii. p. 196.  
 Med. Rat. System. Tom. III. p. 160.

*m* Fred. Hoffman.



an egg, or a little thicker<sup>n</sup>." More instances might be brought of a dropfy of the womb; but I think these are sufficient to shew, that this disease takes place, both in pregnant wombs, and in those which are not pregnant.

Hippocrates himself acknowledges the difficulty of distinguishing this disease, as women sometimes are ignorant of their being affected with it: and, although they perceive a swelling beginning in the hypogastric region, believe themselves pregnant; or, if they do not imagine this, yet conceal the complaint through modesty. He tells us also, that even physicians may mistake, from not inquiring carefully enough into the cause of the disorder. Hereafter, when we treat of the diseases of pregnant women, it will appear that the symptoms of pregnancy are not always certain, and that the most skilful physicians have sometimes been deceived herein. Hippocrates speaks thus of the symptoms of a dropfy of the womb: *The woman's belly will swell, and she will feel a weight in it as if she were pregnant; and will think she feels the child move in her womb, from the agitation of the water which fills it. For from time to time the water fluctuates as in a bladder, and she feels pain in the parts under the navel; on being touched there, the clavicles, the thorax, the face, and the eyes, are extenuated, and the nipples are raised<sup>p</sup>.* Modern writers<sup>q</sup> have added to these symptoms some others; and have noted, that this disease is more incident to barren women than to such as have borne children, and that the mouth of the womb is almost always found smaller and slenderer. Hippocrates says, 'That the nipples are raised; the moderns say, 'The breasts are flatter and soft, and do not swell with milk as in pregnant women.

How-

<sup>n</sup> De Hum. Corp. Fabr. lib. v. cap. 9. Tom. I. p. 438.

<sup>p</sup> Mulier. Morb. lib. i. cap. 21. Charter. Tom. VII. p. 763.

<sup>q</sup> Venter ei magnus erit, et pordus tanquam prægnanti inerit, et in utero ventre velut puer moveri videbitur, uteris nimirum aqua oppletis, aqua agitata. Alias enim atque alias in iis aqua tanquam in utro fluctuat, et pars sub umbilico ad contactum dolet, claviculæ, thorax, facies, atque oculi, attenuantur, et papillæ attolluntur. *Ibid.*

<sup>r</sup> Mauriceau Traite des maladies des femmes grosses, Tom. I. p. 177

However, all things well considered, it is sufficiently evident, that great skill and caution are necessary in order to determine any thing in this case. For the womb, distended by the collected water, rises gradually as in pregnancy: nor can the fluctuation of the water be well perceivable, as the womb is always full and is therefore distended by the increasing quantity of water; because its natural capacity is filled, and cannot receive more without stretching. Sometimes women in a dropsy of the womb are firmly persuaded they are with child, and think they perceive the motion of the foetus; which sensation may arise from flatulæ wandering over the intestines, and successively distending different parts of the abdomen. A barren woman<sup>r</sup> was firmly persuaded she was pregnant, as were also the midwife and several other women; at ten months end a quantity of water, together with flatulæ, issued from the womb, and the swelling of the abdomen subsided: for not water only is collected in the cavity of the womb, but wind also; which, if the *os uteri* be shut up, will produce the appearance of a tympany. Hippocrates, in the book already quoted, mentions an inflation of the womb, and that “when it is distended with air, women think that they have conceived.”

It is known, that air can freely come into the cavity of the womb, especially when the *os uteri* is open after delivery: if, after this, it be stopped up by any cause, the included air, expanding with the heat of the body, may distend the womb; but elastic air also is thrown off from extravasated putrefying blood, which may produce an inflation of the womb. Aëtius has well remarked this. He says, “The womb sometimes growing cold after delivery is filled with air, whether the mouth thereof closes up, or be stopped up with grumous blood.” Then he adds, “Sometimes the flatus breaks forth from the pudendum, so as to be perceived by the patients.” When there is an inflammation of the womb in child-bed women,

<sup>r</sup> Ibid. p. 74.  
p. 349.

<sup>s</sup> De Natura Pueri, cap. 10. Charter. Tom. V.  
<sup>t</sup> De Re Medica, lib. xvi. cap. 30. p. 159.

when its mouth is obstructed by clots of blood, the domen is inflated, not without danger of life; and en most of the symptoms appear which Aëtius enumerates: "A disorder of the pudendum and of the whole belly follows, like the swelling of a tympany, together with pricking pains, which reach to the stomach and diaphragm; and are besides felt in each flank, and on one or both sides of the groin: sometimes the pain is communicated to the navel, loins, and pudendum, and even the head is affected by a sympathy of the parts." For the cure of this sease he advises, that, after long using a bath of e-ollients mixed with carminatives and uterines, "the midwife, applying her finger to the part affected, should gradually break the clot of blood and draw it out."

For whether water or flatus is contained in the womb, the principal hope of cure is in procuring an issue or either, by opening the mouth of the womb; in which, as we may generally hope to succeed, Aretæus has pronounced a dropfy of the womb to be more easy of cure than other dropfies: "For if the os uteri which was closed opens, it pours forth the water, or lets out the air, if either were inclosed in the womb." Baths, fomentations, steams, liniments, &c. therefore, made of the most emollient herbs, are used in these cases; such as were recommended §. 35, no 3. and are exhibited in the *Materia Medica*. To these should be added what are called *uterine* remedies, which act by stimulating, and are enumerated in the *Materia Medica* corresponding to §. 1291, no 4. out of which those are to be chosen which best agree with the age, temperament, &c. of the patient.

Hippocrates \* recommended a similar method. For he advised warm lotions and tepid fomentations, and then gave a purge; and, besides, stimulated the mouth of the womb by a fomentation, which was prepared of ox-dung: afterwards he used a compound medicine, in which cantharides were an ingredient; and after an in-

\* De Causis et Signis Morbor. Diuturnor. lib. ii. cap. 1. p. 51.

† De Natura Muliebri, cap. 2. Charter. Tom. VII. p. 632.



interval of three days, he used another medicine into which gall entered. He advises like remedies in another place <sup>w</sup>; and after using lotions and fomentations he orders sow-bread rubbed in with honey and spread on a linen rag, to be applied to the mouth of the womb and shavings of cypress soaked in water. "According to the degree in which this application irritates and stimulates, it is to be continued for a longer or shorter time; and a tin probe, or the finger smeared with a preparation of this kind, may be thrust up these parts:" For while the os uteri is thus stimulated, there are hopes that the womb by its contracting itself may so dilate the orifice, previously relaxed and softened, that the contained water may be expelled. When, after delivery, a clot of blood begins to stick in the mouth of the womb, a fresh tenesmus arises, which does not cease till the grievance be removed. Hereafter, when we shall treat of a Difficult Labour, it will appear, that midwives, by lightly touching and tickling the mouth of the womb, renew the labour-pains when they grow languid; and even can perceive the first traces of a beginning pang from the mouth of the womb itself, when they touch it in women in labour.

The whole hope of cure therefore consists herein, That, the mouth of the womb being open, those things which are confined in its cavity may come out. But if the mouth of the womb be so stopped up that it can by no art be opened, as happened in the surprising case quoted from Vesalius a little above, then the womb will be distended to a prodigious size. Perhaps, in these circumstances it might be possible by the paracentesis to relieve the disorder, at least in some measure. Indeed, to this end, the substance of the womb must be pierced; but there does not seem to be very great danger attending this, as in the Cesarean operation a large wound is made in the womb, and yet it appears that this has been healed up. Nor will the water left behind, or collected anew after the canula is pulled out, easily pass through the perforation in the abdomen, as this small wound contracts immediately

<sup>w</sup> DeMulier. Morb. lib. i. cap. 60. Charter. Tom. VII. p. 762.

ately in such a manner as almost to close; and the  
 terus, when greatly distended, frequently adheres  
 the peritonæum, as the observation of Vesalius  
 confirms.

1225. **W**HENEVER the same lymph stag-  
 nates, or is extravasated through  
 the whole habit of the subcutaneous fat, that  
 kind of dropsy is formed which is called *ανασαρκα*,  
*το σαρκα*, and *λευκοφληγμα*: which also extends itself  
 about the abdomen and scrotum.

The adipose membrane is dispersed all over the bo-  
 dy; it invests all the muscles, tendons, &c. and also  
 their fibres, and even constitutes in part the very sub-  
 stance of the vessels and viscera. Kaau<sup>a</sup> has very ac-  
 curately described this membrane, and at the same  
 time demonstrated, that a fat oil is secreted from the  
 blood into the cells of this membrane, not by pingu-  
 ous vessels, but by very minute sanguiferous arte-  
 ries, which is again absorbed by the veins, and re-  
 turned into the blood. If more fat is secreted than  
 can be resorpt by the veins, the body is overcharged  
 with fat. If it is absorbed by violent motion, by heat,  
 or by a fever, a sudden emaciation will follow, as of-  
 ten happens in acute diseases. Therefore, when wa-  
 ter abounds in the body, or is not intimately combined  
 with the thicker particles of the blood, it will easily  
 get into the cellular membrane, and occasion a general  
 swelling of the whole habit. Dr Hales<sup>b</sup> produced an  
 artificial dropsy by injecting warm water into the arte-  
 ries of animals; and Kaau<sup>c</sup> tells us, that water injec-  
 ted into the veins swells the cellular membrane soon-  
 er than when it is done by the arteries. For this rea-  
 son a dropsy of the adipose membrane, or of the cel-  
 lular membrane which envelopes all the muscles and  
 fills up their interstices, is called *ανασαρκα*, or *υπο σαρκα*,  
 an *anasarca*; and because the cellular membrane, when

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swell-

<sup>a</sup> Perspir. dicta Hippocr. p. 326, et seq.  
 Exper. xiv. p. 114.

<sup>b</sup> Hæmæstatics,  
<sup>c</sup> Perspirat. dict. Hippocr. p. 335.

swelled up, raises up the skin from the subjacent parts, hence it has also been called *aqua intercus*. Hence Quintus Serenus speaks thus of the dropsy:

*Corrupti jecoris vitio vel splenis acervo  
Crescit hydrops; aut cum ficcata febre medulla,  
Atque avida fauces gelidum traxere liquorem:  
Tum lymphæ intercus vitio gliscente tumescit,  
Secernens miseram proprio de viscere pellem.*

“ The dropsy often arises from some disease in the  
“ liver, or an obstruction in the spleen, or from too  
“ greedily swallowing cold liquors in a fever; then  
“ the lymph swells the body, and raises up the skin  
“ from the bowels, which it should cover.”

The watery serum therefore, collected in the cellular membrane, may be diffused over the whole habit; and particular parts may swell from the same cause. Thus frequently only the feet, legs, and thighs swell by an anasarca: and indeed, this disease generally begins in the lower parts, as the water collected in the cellular membrane tends downwards by its own weight, and makes the feet swell towards evening; which swelling, by the warmth and horizontal posture of the body in bed, disappears, returning again, when by an erect posture the lower limbs are in a dependent position, especially if the ascent of the venous blood be not assisted by muscular motion.

It is further to be noted, that an anasarca may have its seat both about the abdomen and about the scrotum; because sometimes the cellular membrane of these parts, which is easily distended, may swell in such a manner as to put on the appearance of an ascites, or of a dropsy of the testicles; which diseases the anasarca sometimes accompanies, as will be shewn hereafter.

This disease is usually called also λευκοπλεγματία; but perhaps not so properly. Before, at §. 72. when we treated of diseases arising from spontaneous viscosity, it was observed, that the blood sometimes degenerates into such a cacochymia as to lose its redness and consistence, and becomes lighter, acquires a disposition

more



more lax than is natural to it, and approaches to a cold mucus: this the ancients called λευκον φλεγμα, *white phlegm*. But when the blood (its crasis being dissolved into a watery thinness) distends the parts under the skin with a watery humour, the disease is then rather to be called an *anasarca*. In a leucophlegmatia, therefore, mucous viscosity rather prevails; which being diffused over the habit of the body, is more equally dispersed every where. In an anasarca, there is a watery thinness of the fluids; and the watery swelling shews itself first in the lower parts of the body, and afterwards ascends gradually. It was also then noted, that the ancient physicians had observed a leucophlegmatia to pass into a dropsy, when the viscid mucus gradually dissolved into a watery thinness. Celsus indeed distinguished the dropsy into three kinds, of which he calls the second λευκοφλεγματιαν, or υπο την σαρκα, in which disease he says the following things are observable: *The body is sometimes not equally affected by this disease all over, but swells in this or that particular part*<sup>d</sup>: which description rather corresponds with an anasarca, than with a leucophlegmatia, in which the whole habit of the body uses to swell. Hippocrates, after describing φλεγμα λευκον, adds what follows; *If this disease be subdued in the beginning, the patient does well; else the disease turns to a dropsy, and he dies*<sup>e</sup>: and he tells us soon after, that the flesh dissolves, is corrupted, and generates water<sup>f</sup>. Now we know that the ancients called the fat covering the external muscles, *flesh* and the *flesh tunic*: which is also fully confirmed by another passage of Hippocrates; *Pituitous matter produces a dropsy principally in this manner; the fat liquefies, and from the heat of the pituitous matter becomes water*<sup>g</sup>. He says moreover, that a cure can scarcely be hoped

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if

<sup>d</sup> Modo corpus inæquale est, tumoribus aliter, aliterque, per totum et orientibus. Lib. iii. cap. 21. p. 160.

<sup>e</sup> Si igitur curatus fuerit inchoante morbo, convalescit; sin minus in hydropem transit morbus, et hominem perimit. De Affect. cap. 5. Charter. Tom. VII. p. 625.

<sup>f</sup> Ibid. cap. 6. p. 625.

<sup>g</sup> A pituita in hydropem maxime hoc modo devenitur. Colliquatur pinguedo, et a pituitæ ardore aqua fit. De Internis Affectionibus, cap. 23. Charter. Tom. VII. p. 655.

if all the fat is wasted. Aretæus distinguishes these two diseases: "When the whole body swells, if the swelling proceeds from a white, thick, and cold phlegm, this is called a *leucophlegmatia*; if the flesh (or fat) be dissolved to a sanguineous, watery, thin fluid, an *anasarca* is produced<sup>h</sup>."

These two diseases ought to be well distinguished, as they frequently require a different method of cure. A leucophlegmatic girl may be cured by roborants only, without any evacuations, which is rarely the case in an anasarcaous dropsy. They are chiefly distinguished by the following signs: in the former, the whole habit seems soft, doughy, and cold; in the latter, the feet swell first, and are more affected than other parts of the body<sup>i</sup>. Besides, if the swelled parts be pressed with the fingers, they pit and rise again gradually when the pressure is removed; for as the cells of the adipose membrane have a communication with each other, while the fluid is squeezed out of some of the cells by pressure, it passes into others, and returns to its former place when the pressure ceases: But this cannot so easily happen in a leucophlegmatia, as the collected humour is more viscid, and cannot so easily pass into the cells of the *membrana adiposa* which communicate with each other. Hence also we understand why the serum, by its own weight, passes down through the cells of the cellular membrane to the lower parts of the body. Aretæus knew this symptom of an anasarcaous dropsy, for he advises to press this or that part with the finger; for then, says he, "a hollow is made, which remains hollow a long time<sup>k</sup>." It is true indeed, that he reckons the pitting of the parts a sign of an ascites, if the impression remains a long time. But his remark is not quite accurate: for this is observed only when an anasarca accompanies an ascites, as is sometimes the case; but an ascites is often without an anasarca, and then the abdomen is tense, nor do the integuments give way to pressure.

An anasarca may occupy the whole habit, as the cel-

<sup>h</sup> De Causis et Signis Morbor. Diuturnor. lib. ii. cap. 1. p. 49.

<sup>i</sup> Pathol. lib. vi. cap. 7. parte 2. p. 151.

<sup>k</sup> Loco modo citato.

cellular membrane is diffused all over the body. It is obvious, therefore, the cure will be very difficult, as the whole blood is dissolved to a watery thinness; in which case Hippocrates, as was said a little before, scarce allows any room for hope, *si omnis pinguedo perierit*, “if all the fat be wasted.” And then also Aretæus pronounces the cure of the anasarca to be more difficult than that of a tympany: “The physician “ must change the whole man in this disease; a work “ which scarce the gods themselves could perform<sup>1</sup>.” And that he meant to apply this terrible prognostic to a dropsy of the whole habit, is evident from hence, that he presently subjoins, that sometimes a man has the dropsy only in a small part, as in the head, lungs, liver, spleen, &c.

Besides, in such a case there is reason to apprehend, that the cellular membrane may be equally distended with water in the internal parts. It was observed before, at §. 1220. that such watery vomitæ have been observed in the cellular substance of the lungs; and we shall see hereafter, that hydatides seem to proceed from some fault in the cellular membrane. I have seen a true anasarca of the pia mater; the cellular substance interposed between the pia and dura mater being distended with water. At first view, a viscid mucus seemed to cover the pia mater; but on piercing the arachnoid membrane with the point of a lancet, a considerable quantity of thin water flowed out, and the whole tumour subsided. The reader may also look back to what was said at §. 1010. N<sup>o</sup> II. 3. on the subject of an Apoplexy arising from a similar cause.

It is also plain, that an anasarca may be productive of various evils, according to the seats it occupies; not only in the internal, but also in the external parts of the body. I have seen, in a dropsy of this last kind, the eye-lids so swelled that they could not be separated. It frequently happens, if the anasarca possesses the scrotum, that the penis swells wonderfully, and the tumid præputium is strangely twisted, so as to occasion a difficulty, and sometimes a total suppression of urine;



so that scarification is necessary, to let out the water contained in the cellular membrane of these parts. Aretæus has taken notice of this symptom. He says, "The testicles and præputium are swelled, and the whole penis is twisted crooked from the inequality of the tumour m."

Other things however being equal, an anasarca seems easier of cure, unless it occupy the internal parts of the body, than other kinds of dropsies, as numerous large veins run thro' the cellular membrane, which may re-absorb the collected serum; and, besides, the stagnating fluids may be put in motion by friction, and resorption be promoted by this means. At the same time also a passage may be easily procured for the collected lymph, by scarification, blistering, and caustics; of which hereafter.

§. 1226. **W**HEN this water is collected either in the duplicature of the peritonæum, in the cavity of the abdomen between the peritonæum and the abdominal viscera, or in the dilated cavities of the glands and vessels contained in the abdomen, the disease is called an *ascites*; but if the abdomen is turgid by a rarefied vapour arising either from water, pus, ichor, or air, inclosed and putrefied there, it is called a *tympany*.

When the abdominal region is considerably swelled by the collected water, the disease is called *ασκιτης*, from its resembling a leathern sack or bottle, called in Greek *ασκος*, *ascos*, in which the ancients used to keep their wine. The collected water may occupy this region in three ways: Either it fluctuates freely in the cavity of the abdomen, and washes the abdominal viscera on all sides; or it is lodged in dilated hollow membranes; or lastly, it is collected out of the cavity of the abdomen, and then it is supposed to lodge between the duplicature of the peritonæum.

But

m Ibid. lib. ii. cap. i. p. 51.

But many have doubted, whether the peritonæum be really double. Galen thus describes this membrane, when in treating on the wounds of the abdomen he enumerates the integuments of this part; *That which follows is called by some the peritonæum, they supposing it to be one simple body. But this is not so; for it is composed of two bodies, of which both are bloodless and sinewy: but one of them is an aponeurosis of the transverse muscles; the other membrane is as thin almost as a spider's web, which latter indeed is the true peritonæum*<sup>a</sup>.

From this description it appears plainly, that Galen did not account the peritonæum a double membrane; but meant to say this only of that aponeurosis of the muscles which lies upon the peritonæum. The cellular membrane seems to be interposed between this aponeurosis and the peritonæum: and that accurate anatomist Winflow, accounts it a part of the peritonæum<sup>b</sup>, and observes, that this cellular membrane is not every where of the same thickness, but in some places is very slender, in some scarce visible at all. At the same time he tells us, that the *duplicature of the peritonæum* is an improper appellation. Dr Douglas is of the same opinion<sup>c</sup>: and maintains that this cellular substance, placed between the peritonæum and the incumbent parts, is of the same effect “as cotton  
“or silk stuffing between the cloth and the lining of a  
“garment.”

He then confesses, that formerly, indeed, he thought that water was collected between the duplicature of the peritonæum; but that he is now fully convinced, “that  
“this happens between the peritonæum and the ten-  
“dons of the transverse muscles<sup>d</sup>.”

But is it, after all, certain, that the peritonæum  
is

<sup>a</sup> Quod vero deinceps excipit, ab illis quidem vocatur peritonæum, putantibus videlicet, illud unum et simplex esse corpus, minimeque compositum: sed non ita res habet, quum id compositum ex duobus corporibus sit, quorum utrumque et exsangue et nervosum est. Verum alterum eorum aponeurosis est musculorum transversorum; alterum membrana prætenuis velut aranea, quæ utique verum est peritonæum. *Metb. Med. lib. vi. cap. 6. Charter. Tom. X. p. 139.*

<sup>b</sup> Exposit. Anatom. Traite du bas Ventre, n<sup>o</sup> 28. p. 501.

<sup>c</sup> Descript. Periton. p. 37.

<sup>d</sup> Ibid. p. 98.

is a single, and not a double membrane? Certainly, such single membranes seldom occur. KAAU<sup>c</sup> has described the peritonæum the most exactly of any anatomist, and demonstrated the wonderful manner in which this membrane not only covers the internal surface of the abdomen, but also wraps up each viscus, produces the mesentery and omentum, &c. From whence he concludes, “ that this  
 “ wonderful membrane was made continuous and  
 “ extending every where, to arrange the parts, to  
 “ clothe them, to keep them in a wonderful manner in their places, of one and the same texture in  
 “ every part; every where sending forth processes,  
 “ which stretching to every particular part, includes  
 “ them, and in which there is no end or beginning<sup>f</sup>.” But the peritonæum is a vascular membrane; and the same author, who with so much industry has examined the human frame, “ admires the apparatus of  
 “ nature, in contriving the distribution of the vessels: they are never pendulous, never distributed or  
 “ uncovered on the surface; but, always creeping between two membranous folds, are there maintained in orderly arrangement<sup>g</sup>.” He has excellently well confirmed this, from the structure of the pericardium; which, before Ruysch’s art of injection, was accounted a simple, thin, pellucid membrane; but after successful injections, it has appeared, that numerous vessels are distributed in the cellular substance, between the double membrane. Numerous hydatides have been found in the pericardium, which can scarce be conceived, unless this membrane were double.

If, besides, we consider, that the peritonæum is sometimes wonderfully altered by diseases, so as to be much thickened, and to be capable of being divided into several lamina, this opinion will be more and more confirmed, that the peritonæum is not absolutely a single membrane, but, like most of the rest, consists of two lamellæ, which naturally indeed cohere, but yet by diseases may be separated, and thus form

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<sup>c</sup> Perspirat. dict. Hippocr. p. 255, et seq.  
<sup>f</sup> Ibid. p. 290.

<sup>g</sup> Ibid. p. 267.



a cavity, in which watery serum may be collected. In hernias, when the disorder has lasted long, and requires a surgical operation, surgeons have frequently found themselves obliged to cut through several lamellæ, before the intestine is laid bare, and the sack of the hernia entirely opened.

But perhaps it may not be so easy to know, in bodies of dropfical persons that are dissected, whether such a dropfy of the abdomen, as does not occupy the cavity of the belly, has its seat between the duplicature of the peritonæum, or between the peritonæum and the aponeurosis of the abdominal muscles; as, when the disorder has been of long standing, the membranes, which inclose this water, are greatly altered from their natural state. Nor does it seem of any great moment, with regard to the cure of this disease, whether the water be lodged between the duplicature of the peritonæum, or between the peritonæum and the aponeurosis. It will indeed always be of use, to know whether the water be lodged in the cavity of the abdomen, or not; and how this is to be known, we shall presently explain.

It may not be improper, however, to attend to what approved authors assert, from their observation of what they have seen in dissecting persons who died of this disease.

Nuck<sup>h</sup>, by experiments made on dogs, discovered, that lymphatics ran between the duplicature of the peritonæum: and he thence deduces the origin of a dropfy of the peritonæum, which he calls a new disease, because he thought it was not known before he discovered it. And he thinks this disease is chiefly incident to gluttons, voracious feeders, and pregnant women; while, on one hand, there is a pressure of the full stomach and intestines, or of the distended womb; and, on the other, a resistance of the abdominal muscles to this pressure; whence, if the lymphatics be over-filled, they may easily be burst, and lymph distil from them between the duplicature of the peritonæum. He afterwards relates a case of a drop-

<sup>h</sup> Adenogr. Curios. p. 99.

dropfical woman, whose body he difsected, and whom he had tapped before her death, and drawn from her ninety-five pints of water. On cutting open the integuments of the abdomen, he was surpris'd not to see any of the viscera (for he thought the dropfy had been an ascites); but on a further scrutiny, and deeper incision, the viscera all shewed themselves: "And," (says he) it was observable, that the peritonæum had assumed the form of a bag, in the duplicature whereof this vast mass of water was concealed; and that the internal membrane had receded from the external membrane, and was grown so thick, that one of the lamina only was three or four times as thick as the whole peritonæum is in its natural state; and so exactly did this bag inclose the extravasated water, that not a drop escaped from it, so as to wet in the least the abdominal viscera." He then relates a similar case from Tulpus<sup>i</sup>, of a dropfical woman, between the duplicature of whose peritonæum 110 pints of water were lodged, and bore with great spirits so prodigious a load of water for more than seven years; so that she was able to walk as well as a person in perfect health, to take long journeys, and (which is still more surpris'g) to ascend the steps of a very high tower at Cleves. On dissection, all the viscera were found entire and uncorrupted, except the left kidney, which was bigger than common; as also the Fallopian tubes, which were so obstructed, as to be quite impervious. The coats of the peritonæum, between which this immense collection of water was lodged, were a finger's breadth thick.

The history of physic affords many like cases, which shew, that a vast quantity of water may often lodge in the abdominal region, and yet out of the cavity itself of the abdomen: but those already recited may suffice. It is, however, always found, that the membranes which contain the waters have been much viated and thickened; and, therefore, there does not seem to be sufficient ground certainly to conclude, that these waters were lodged between the duplicature

<sup>i</sup> Observat. Medic. lib. iv. cap. 44.

ture of the peritonæum: for they, who are of the contrary opinion, may allege, that the cellular membrane, placed between the peritonæum and the aponeurosis of the abdominal muscles, may seem much more likely to be depraved in the manner described above, than a thin simple membrane; and hence they will affirm, that the back-part of such a dropfical sack is formed by the peritonæum, but the fore-part by the aponeurosis. Besides, there are observations<sup>k</sup> which shew, that such collections of water have been found between the peritonæum and the transverse muscles; although many other observations affirm, that the waters were lodged in the duplicature of the peritonæum: but on attentively perusing the cases brought in proof of this, it does not appear to me, that the observers have absolutely demonstrated it; but that most authors, according to their pre-conceived opinion, have pronounced, that the waters lodged in the region of the abdomen, but not in its cavity itself, had their seat in the duplicature of the peritonæum, or between this membrane and the aponeurosis.

Dr Mead held the peritonæum to be a double membrane, and mentions three species of an ascites: the first, when water is lodged in the cavity of the abdomen; the second, when water is extravasated between the aponeurosis of the transverse muscles and the peritonæum; the third, when the fluid, falling between the coats of the peritonæum, forms, by distending them, a receptacle for itself. And he gives us a very singular case of a woman, who had all these three kinds of dropfies: “The body being opened, a vast  
“ quantity of water first issued from the cavity formed  
“ between the tendons of the transverse muscles  
“ (separated by the disease from the peritonæum), and  
“ the peritonæum, together with many large and entire  
“ hydatides. After this, the peritonæum being cut, seven or eight pints of a thick viscid humour came out, with which many putrefied glands  
“ were mixed. We began now to wonder, that none  
“ of

<sup>k</sup> Philosophical Transactions, n<sup>o</sup> 299. p. 1977. Abridg'd, Vol. V. p. 386.



“ of the intestines were visible, which we sought for  
 “ in vain; till, cutting through a membrane as thick  
 “ as leather, we found at last the stomach, and all the  
 “ intestines, together with the omentum, crowded  
 “ into a narrow space, and, as it were, concealed  
 “ This membrane was the interior coat of the peritonæum, which we have already observed was double,  
 “ and that the outer part resembled leather; which  
 “ at first easily deceived us into an opinion, that this  
 “ was the whole peritonæum <sup>1</sup>.”

From all that has been said it seems to follow, that a dropsy may possibly have its seat between the duplicature of the peritonæum, although probably this happens but seldom; and it is not always very easy to distinguish, whether the water be lodged between the peritonæum and the aponeurosis of the abdominal muscles, or in the duplicature of the peritonæum, as the membranes are so vitiated; and sufficient time is not always allowed, for those who dissect the bodies of such as have died of this disease, to examine accurately into all particulars.

We are next to consider, by what symptoms an ascites (of which the water is lodged out of the cavity of the abdomen) is to be known: it is sufficiently evident, that these symptoms will be more distinguishable in the beginning of the disease, than when the dropical swelling is increased to a vast size.

Littre <sup>m</sup> has described the case of a lady, who died of a dropsy of the peritonæum; and has accurately enumerated the diagnostics of this disease, which are,

1. If the beginning is gradual, and the increase slow: this is principally remarkable in the first stage.

2. If the belly does not swell equally all over, as when the water is lodged in the cavity of the abdomen; but is circumscribed, especially towards the forepart, and the form of it not much altered by different positions of the body. Thus it is distinguished from a dropsy in the cavity of the abdomen; for, unless the abdomen be very much stretched, the swelling changes place,

<sup>1</sup> Moit. et Præcept. Med. p. 128, &c.  
 l'an 1707. Mem. p. 667, et seq.

<sup>m</sup> Acad. des Sciences,

place, as the patient moves from one side to the other. Thus also it may be distinguished from a beginning tumour of the ovarium, which occupies the lower lateral region of the abdomen, and is for the most part attended with an obtuse pain. But it is to be noted, that it has been observed<sup>n</sup>, that the cavity of the abdomen was divided into two parts, by a hard membrane, an inch thick, placed obliquely, so as that beginning from the right kidney, and descending thence, it terminated at three inches from the lower part of the left kidney: in the upper part of the abdomen there was nothing extravasated; but the lower part was overflowed with a black, thick, glutinous humour, which had a cadaverous stench. In such a case, therefore, we easily see the abdomen must be unequally distended.

3. If no fluctuation is perceived in some part of the abdomen out of the limits of the tumour.

4. If the lower extremities do not swell, or however but little, and that very slowly.

5. If the patient bears the disorder long, without any remarkable injury to the functions of the body, and scarce suffers any other inconvenience than arises from the size and weight of the tumour gradually increased.

It is certain, a woman whose belly was amazingly swelled, lived upwards of thirty years, healthy in other respects, and without any swelling in the legs, in whose body a vast quantity of water was found in the duplicature of the peritonæum<sup>o</sup>. But we read of a still more surprising case of a woman who bore this disease forty-four years, and at last died in the eighty-second year of her age, the swelling remaining in the same state all the time<sup>p</sup>. After her death, above fifty pints of a fetid, thick, viscid, salt humour were found in the folds of the peritonæum.

Listre adds, in the place above quoted, some other symptoms also, which appear after the paracentesis has

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<sup>n</sup> Ibid. Jan 1703. Mem. p. 114.

<sup>o</sup> Philosophical Trans-

actions, n<sup>o</sup> 348. Abridged, Vol. V. p. 288, 289.

<sup>p</sup> Medical

Observations and Inquiries, Vol. I. p. 7, et seq.

been performed: the whole quantity flows out; and when the bag, which contains the dropfical fwelling, is entirely evacuated, and warm water injected by the trochar, all comes back again. But this is not the place to confider thefe fymptoms; we fhall fpeak of them hereafter. Thofe figns are only now to be confidered, which difcover the difeafe in its beginning.

When the water is lodged out of the cavity of the abdomen, the bowels are not soaked by it; the patient therefore can fupport the difeafe longer, and enjoy tolerable health in other refpects. And obfervations, in which we may confide, fhew, that in thefe cafes, a good complexion, a tolerably free fecretion of good urine, a good appetite and digeftion, and regular alvine excretion, remain for many years. From which appearances, alfo, we may deduce diagnostics for diftinguifhing this difeafe. The fize of the tumour alone, when the dropfy is much increafed, is troublefome, and injures the vifcera by its preffure; but as both the peritonæum and the integuments of the abdomen eafily give way, the abdominal vifcera are not much compreffed in the beginning of the difeafe.

But there are alfo better hopes of a cure in this kind of dropfy, than when the water is lodged in the cavity of the abdomen, as the dropfical bag may be entirely emptied by performing the paracentefis; and if, on the admiffion of air, putrefaction fhould begin in the emptied bag, this might be corrected by antifeptic and detergent injections; the flimy feculence, which ufually fmears the furface of this kind of bag, might at the fame time be wafhed off; and the fides of the bag be fo cleared, that perhaps a moderate compreffion might make them grow together, and the difeafe be entirely cured.

We are now to treat of that kind of afcites, wherein the water is extravafated in the cavity itfelf of the abdomen. Which, again, is of two kinds: In the one, the water fluctuates freely, and wafhes all the vifcera of the abdomen; in the other it is collected in the dilated cavities of the glands, or in the veffels, and is called an *encyfted* dropfy.

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When the fluctuating water is collected in the cavity of the abdomen, it will give no tokens of its existence till the abdomen begins to be distended by its increasing quantity. It is true, indeed, that from foregoing diseases, the altered complexion, the small quantity of urine, &c. a skilful physician frequently collects, that a dropsy is to be apprehended; and thus foresees it when future: but we are now speaking of the signs of a dropsy actually present. As the water, beginning to collect in the cavity of the abdomen, by its weight sinks to the lower parts, this swelling will begin from the lower part of the abdomen, and ascend by degrees, as the quantity of the extravasated fluid increases. Hence it is not strange, that an ascites is not easily known. And Aretæus seems to point out this, when he says, "For neither do we call the fluid, fluctuating in the lower belly, a *dropsy*, as nothing is in fault there: but when the disease proceeds to bloat and swell up the body, and the complexion grows sickly, the watery habit which produces these appearances is a dropsy, and goes by that name." And soon after, he adds, "If a great quantity of water is contained in the peritonæum, and the intestines float in it; this is called an *ascites*." He observes also, that sometimes a dropsy of that kind, which swells the whole body, is joined with a dropsy in the flanks. On this account he seems to have added the symptoms of an anasarca, to those of an ascites: For thus he speaks, "In an ascites, one may see a swelling in the flanks, and an oedema of the feet; the face, arms, and the rest of the body, become thin; the testicles swell, and the præputium and whole penis are crooked from the unequal swelling. If you touch any part, and gently press it inwards, the water will shift to another part; and even in turning the body from one side to another, the water falling to that side which is lowest, will make a swelling and fluctuation, and the sound of the fluctuating water is heard."

When the abdomen begins to fill with water, the  
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swelling is first perceived in the ilia or flanks; and as the belly enlarges, there will be a greater pressure upon the lower parts, by which the iliac veins are compressed; and hence, in an ascites, the legs and thighs often swell: on the contrary, when water is collected between the muscles of the abdomen and the peritonæum, or in its duplicature, the iliac veins are not compressed; and therefore, the lower extremities are not at all, or but very little swelled; and then not until the swelling in the abdomen is so much increased as to compress the viscera.

The fluctuation of the water, and its falling towards the side on which the patient lies, are easily perceived, when the cavity of the abdomen is not quite filled; for when one shakes a bottle quite full of liquor, no sound or fluctuation is perceived. But as physicians sometimes are not consulted, till the disease is at its height, and the whole abdomen is full and turgid, there is more need of caution in forming a diagnosis. It will certainly be of great service, to have a right knowledge of the history of the disease in its beginning: but this is often wanting; and can hardly be obtained with any accuracy from the patient or the attendants. But the physicians are used to examine the swelled abdomen in this manner: They apply their fingers to each side of the belly, and then strike strongly with one finger on one side; if then, by the fingers applied on the opposite side at the same time, an undulation is felt, they judge (and with reason) that the abdomen is filled with fluid. Monsieur Du Verney the younger<sup>r</sup> has observed, that on account of the great tension, or from the thickness of the integuments, the fluctuation cannot be perceived by this method; in which case he advises, that, putting one hand on the navel, with the other we should strike the lower part of the abdomen, so that the force of the stroke may be directed towards the upper part. But altho' this gentleman was well versed in the examination of dropical persons, yet he candidly owns, that he has sometimes been deceived, having imagined he could

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<sup>r</sup> Acad. des Sciences, l'an 1703. Mem. p. 186.

perceive a fluctuation, when nevertheless he afterwards found no water in the cavity of the abdomen, but that the intestines were full of wind and of a glutinous matter.

The best physicians, and such as were most versed in the diagnostics of this disease, have been known to mistake. Sydenham<sup>s</sup> observes, that preternatural fleshy excrescencies have sometimes been mistaken for dropsies, as also have flatulencies; of which we shall make mention, when we come to speak of the Tympany. We read<sup>t</sup> of a wonderful case of this kind. A lady of forty-seven years old, being under deep affliction for the death of an only son, began to languish and grow thin: after this, the abdomen swelled gradually; and as all the symptoms of an ascites appeared, the paracentesis was tried four times without any effect, as no water at all came out, although a fluctuation was evidently perceived. On dissection, the left kidney was found of an enormous size, and weighed thirty-five pounds, and was quite altered from its natural conformation. The water, whereof the fluctuation was perceived while the patient was living, lodged only in the void interstices left by this prodigious kidney; so that it is not to be wondered that the paracentesis produced no evacuation. Like instances are to be found in Bonetus<sup>u</sup> and other writers.

It is therefore evident, that we are not to form any conclusion rashly in this case; and that the physician's reputation for discovering diagnostics will be in some danger, unless he be very attentive to every thing that has happened through the whole course of the disease.

But if so much skill is required to determine, whether the swelling of the abdomen arises from water collected in the cavity, much more is required to determine about the nature and qualities of the fluid contained. Vernage<sup>v</sup> saw, to his great surprise, on

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<sup>s</sup> De Hydrope, p. 611.<sup>t</sup> Acad. des Sciences, l'an 1732.

Hist. p. 45, et seq.

<sup>u</sup> Sepulcr. Anat. Tom. II. p. 448, &c.<sup>v</sup> Acad. des Sciences, l'an 1700. Hist. p. 15.



piercing the abdomen of a dropfical maiden, that no water iffued out, but a fluid in colour and confiftence refembling milk, and even taffed like milk except that it was a little falter. It frothed like milk when let fall from any height, and fwelled like milk when fet over the fire; but it was much lighter, and did not coagulate with acids, but only with falt of tartar. It was found neceffary to repeat the paracentefis every fortnight; and at each time thirteen, fourteen, nay, fifteen pints of this liquid were drawn away: ſhe laboured under this diſeaſe a whole year, and then died. A healthy girl, ſeven years old, after a fall on her head, began to languish: a chylous fluid was diſcharged along with the fæces, and her whole body was emaciated: this chylous flux then ceaſed, and the abdomen began to ſwell; fix or ſeven pints of a chylous fluid were drawn off by tapping, and ſhe died a fortnight afterwards. After death, the ſame quantity of a like fluid was found in the cavity of the abdomen<sup>w</sup>. Sometimes, although a manifeſt fluctuation may be perceived, a ſmall quantity of a tremulous, gelatinous fluid is brought out on piercing the abdomen. This happened with me, in the caſe of an old maid; on whom, as ſhe would by no means be perſuaded to admit of the ſurgeon's hand, I performed the operation of the paracentefis: And although I made uſe of a tolerably large canula, on drawing out the trochar nothing flowed out: yet the probe being put in through the canula, found no obſtacle; and with difficulty, on compreſſing the tumid abdomen, ten ounces of a browniſh kind of jelly were ſqueezed out.

Sometimes the water iſſues forth bloody; ſometimes green, brown, &c.: nay, on repeated tapping, a different fluid is let out each time; as will be mentioned hereafter, when we come to ſpeak of the operation.

Hence the phyſician's ſafeſt way ſeems to be, to affirm nothing certain concerning the nature of the fluid before the operation is performed.

But the water in an aſcites does not always float  
freely,

<sup>w</sup> Ibid. l'an 1710. Hiſt. p. 52.

freely; but is often found to be contained in greater or less membranous receptacles, and then it is called an *encysted* dropfy.

We can easily conceive it possible, that membranous cavities may be filled with lymph, and gradually distended as the quantity of the fluid increases; and that they may be stretched to a great bulk, if the excretory duct be by any means rendered impervious. We frequently see such tumours in the external parts of the body; as for instance, in the borders of the eye-lids; and these tumours are usually called *hydatides*: it is likewise certain, that the same thing may also happen in the cellular membrane. I have seen such small hydatides in the white of the eye, on the edge of the cornea, and on the sclerotica; nay, even on the surface itself of the cornea, which, being pricked with the point of a lancet, presently subsided, leaving no injury behind them. But that the vessels themselves of the body may degenerate into hydatides, we formerly noted at §. 112, n<sup>o</sup> 1. when treating of obstructions: thus Ruysch found the uterine placenta entirely changed into hydatides; and I have in my own possession part of such a morbid placenta: It was noted at the same time, that sometimes such hydatides had been found floating at large (without any connection either with each other or with the neighbouring parts) in one common larger membranous bag; nay, that there have been found large hydatides, which contained others of less size freely floating in their cavities.

The ancient physicians were acquainted with this species of the dropfy; for thus we find Aretæus expressing himself: “ Another kind of dropfy has been  
“ observed, of the following nature: Numerous small  
“ bladders are formed in that cavity which is the  
“ usual seat of the ascites. And that these bladders  
“ contain a great quantity of fluid, this is a proof:  
“ If the abdomen be pierced, a very small quantity  
“ of water is drawn out, because these bladders in-  
“ clude it, and prevent its falling into the cavity; but  
“ if you push the instrument so far as to penetrate  
“ the



“ the bladders themselves, the water flows out. And  
 “ this is no slight kind of dropsy <sup>x</sup>.”

At the same time this author ingenuously confesses, that he knew nothing certain concerning the origin of these bladders. But Aëtius also writes in like manner: “ There arise sometimes small swellings, in  
 “ form like bladders, between the peritonæum, the  
 “ omentum, and the intestines; and these swellings  
 “ contain a serous fluid: they are to be known by an  
 “ unequal fluctuation, not perceivable all over the  
 “ belly, but in some particular place, confined as it  
 “ were by lines drawn as boundaries, which is the  
 “ peculiar seat occupied by the fluid <sup>y</sup>.”

Although some of the moderns place the origin of hydatides in the cavities of glands preternaturally dilated, or in the cellular membrane, yet others have thought the lymphatics to be the most likely seat. Nuck <sup>z</sup>, who carefully examined the lymphatics, was of this opinion; and Morand <sup>a</sup> very ingeniously illustrates and confirms it. Hydatides most commonly are lodged, at their first formation, under the external coats of the viscera; but here likewise a vast number of lymphatics are found. Hydatides contain a lymph similar to that of the lymphatics: the lymphatic vessels through their whole length appear knotty, while their cavity is every where distinguished by two opposite valves, which are so constructed, as to admit the lymph flowing from the narrower to the broader part, but obstructs its return. It is also to be remarked, that the lymphatics are most contracted at that part where a valve is placed, and that they are concave towards the wider part, and convex on the other. If now, from any cause, these tender vessels are compressed, or obstructed, the intermediate spaces will swell; the concave sides of the valve will be distended by the incumbent fluid; and the double valves lying close upon each other, being dilated by the pressure, and the plastic nature of the lymph, may unite  
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<sup>x</sup> De Causis et Signis Morborum Diuturnorum, lib. ii. cap. 1. p. 51.

<sup>y</sup> Serm. X. cap. 20. p. 234.

<sup>z</sup> Adenograph. Curios. p. 88.

<sup>a</sup> Acad. des Sciences, Pan 1723. Hist. p. 32, et seq.



and adhere together; and thus all that part of the lymphatic vessels, which lies between the two valves, will be distended into an hydatid: Nor does it seem impossible, that an hydatid so found may be loosened from the continuity of the lymphatic (as these vessels are exceeding fine) and fall into the cavity of the abdomen; and this would account for the origin of hydatids floating at large.

This ingenious writer is also of opinion, that each of the valves, when greatly distended, might degenerate into hydatides, as by degrees from the degenerating lymph an entire globe might be formed from the valve; and, as some space might still remain between two such small globes, some quantity of lymph getting through, might increase the bulk of the hydatides thus formed, till at last that small quantity which still transuded, moving very slowly, or even entirely stagnating, might be concreted, and adhere to the hydatides already formed. Thus he endeavours to explain the rise of those hydatides, which are called *racemosa*, *clustering*, because they cluster together like grapes.

Now as (which we shall remark hereafter, §. 1229.) all obstinate obstructions of the viscera, and also schirrhuses, are esteemed causes of the dropsy, this opinion, that hydatides may be formed from a fault in the lymphatics, does not seem altogether improbable, although it is not without its difficulties, which perhaps further observations may clear up.

Whatever be determined concerning the origin of hydatides, it is certain they have been found in dead bodies. Bianchi asserts, that he saw the body of a man aged forty, wherein “not only all the viscera of  
“the abdomen, the liver, spleen, mesentery, pancreas, kidneys, bladder, intestines, &c. were full of  
“innumerable small bladders distended with serum,  
“and entirely resembling hydatides; but moreover,  
“these supposed hydatides lay thick in four or five  
“rows one over the other<sup>b</sup>.” But as he had found like hydatides in the cavity of the intestines, and lymphatics had not been observed by anatomists to be so

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<sup>b</sup> Hist. Hepat. Tom. I. parte ii. cap. 3. sect. 2. p. 139.

numerous on the surface of the viscera as that they should lie in several rows one upon another; hence was not inclined to refer the original of these hydatides to a disease of the lymphatics, but rather to the membrane which surrounds the viscera being swelled up at various distances by serum extravasated beneath it. But he asserts; that hydatides may be distinguished from other watery humours by their extreme transparency.

A like case is also related by Schenck<sup>c</sup>, of a dropical woman, in whom all the viscera had, both on their surface and in their cavities, pendulous receptacles filled with a citron-coloured water, which kept sweet more than twenty days. Nor were even the cavities of the heart, the stomach, intestines, &c. free from this disease, which seems surprising. Numerous instances of an encysted dropsy occur in writers but it seems superfluous to relate any more.

It will always, however, be necessary to know whether the swelling of the abdomen be caused by water floating in its cavity, or by water contained in a cyst. Du Verney<sup>d</sup> has collected the following signs: 1. If the swelling has increased slowly, so that two years or more have passed before the abdomen grew to a great size; 2. If in the beginning of the disease, the patient perceived a round swelling, gradually increasing without giving much uneasiness; 3. If the feet, legs and thighs swell very late, and the belly does not change its figure when the patient alters his posture (as it does when water floats at large in the abdomen); then there is great reason to suspect an encysted dropsy. It is also to be remarked, that many of these signs are nearly the same with those which distinguish a dropsy of the peritonæum.

However, great circumspection is necessary in forming the diagnostics, if the physician has not attended from the beginning of the disease. Dr Haen<sup>e</sup> relates the case of “ a young man who had a hard swelling in “ the belly, of an enormous size and smooth, in a very

<sup>c</sup> Observ. Medic. lib. iii. obs. 4. p. 341.  
l'an 1703. Mem. p. 195.

<sup>d</sup> Acad. des Sciences,

cachectic habit, in which there was the greatest reason to suspect an encysted dropfy, as the swelling extended over the whole abdomen, except the lowest hypogastric region: this youth perished of a spina ventosa, which had rendered carious all the vertebræ of the back and loins, and the os sacrum itself; and this monstrous size of the abdomen proceeded solely from an enormous swelling, beyond all instances ever known by anatomists, of the liver and spleen, both however perfectly sound." What a shameful mistake would it have been, to advise tapping in this case!

Besides, it may happen, that such a dropfical bag being over distended by the collected water may burst, and pour out its contents into the cavity of the abdomen. It is true, indeed, that frequently the sides of a bag of this kind grow thicker as the distension increases; but there have been found after death (when the whole abdomen was full of water) the torn pieces of a large bag which had formerly contained the water.

Nor is this all; for water has been found in the cavity of the abdomen, with an encysted dropfy at the same time. An instance of this kind is related in the *Memoirs of the Academy of Sciences* for the year 1703. On piercing the abdomen, a small quantity of water flowed out; the swelling of the belly was not much diminished; but on putting the probe through the canula, it was evident that the needle of the trochar had penetrated the cavity of the abdomen: a manifest resistance was felt; and as Monsieur Du Verney, who had great skill in this disease, was certain he touched a cyst or bag, he pierced it, and there flowed out about six pints of a yellowish mucilaginous humour, which was entirely different from that which had issued from the cavity of the abdomen. He repeated the operation on this patient, with the same precautions; and afterwards performed it under the same circumstances on other patients, with a like event.

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However, it appears that the physician ought to be very certain of not mistaking the diagnostic symptom of this disease, before he ventures to pierce a swelling which resists the canula, as scirrhus tumours have frequently been found to accompany the dropsy, which when the abdomen is distended by the water, are not sensible to the touch.

But the abdomen has sometimes been greatly swelled, though no water has been found in its cavity, or in the duplicature of the peritonæum, or between that and the abdominal muscles; this kind of swelling is called a *tympany* (from the word *tympanum*) because the turgid belly, struck by the hand, sounds like a drum. This disease is also called a *dry dropsy*, and is supposed to arise from a rarefied vapour.

Galen, discoursing of the fulness of the pulse, says we cannot know by the touch, whether air only, or water also, be contained in the arteries; and on this occasion he adds, as an instance to confirm what he has been saying, that we cannot, in a dropsy, know, merely by the touch, whether water or air be contained in the belly: *but in order to be certain, we are obliged to strike the abdomen* (το επιγαστριον), *to try whether it will sound from the blow like a drum; or to change the patient's posture, and make him lie on one side and on another, to find if we can perceive any fluctuation: the noise, like the sound of a drum, shews that air (or a vapour) distends the abdomen; and the fluctuation is a sign, that the belly is filled with water* f, &c. It is to be noted, that Galen calls that which distends the abdomen in a tympany, at one time *aer*, air; and at another, *spiritus*, spirit, or vapour. But we shewed in the beginning of this chapter, that the ancient physicians called that steam or vapour, which fills all the cavities of the body, *spirit*; but when this steam was condensed into a visible fluid, they called it then *ichor*: and

f Sed ad veram notitiam comparandam pulsare cogimur abdomen (το επιγαστριον), ut cognoscamus, si velut tympanum resonet: secundo loco aliter componere hominem, et in latera convertere quo fluctuationem aliquam audiamus; ac nobis strepitus per modum tympani spiritum annuntiat, fluctuatio humorem, &c. *De Diagnosc. Puls. lib. iv. cap. 3. Character. Tom. VIII. p. 163.*

and they also believed, that the elastic vapour, which distends the abdomen in a tympany, was capable of being changed into water. Hence Aëtius, treating of this disease, says, "A tympany is a flatulent tumour, formed of superfluous air distending the parts near the epigastric region; and at the beginning, there seems to be nothing but air in this tumour: but afterwards, this aerial vapour grows thick, and becomes as it were misty; and thus a misty kind of fluid is collected, together with the air<sup>s</sup>." Thus also Aretæus calls this disease, "a moist suffusion, which fluctuates in the flanks, which being inflated, found, when they receive a blow, like a drum<sup>h</sup>." He seems to be entirely of opinion, that this condensed vapour would produce an ascites; for thus he speaks soon after: "The tympany is discoverable, not only by the swelling to the sight, but also to the ear by the sound; for the abdomen, struck by the hand, emits a sound; nor does the air change place by the turning of the body: for although the cavity which contains the air be somewhat stooping, yet there remains the same quantity of air both above and below: but if the air be changed to mist or water (for an ascites sometimes is generated from a tympany), if all be not so converted, but only a part, that part, now become water, fluctuates in the belly."

After his time, many eminent physicians appear to have been of the same opinion, and to have thought that the tympany could scarcely be accounted a peculiar species of dropfy. For thus Hoffman expresses himself: "As to that kind which has been usually called a *tympany* or *dry dropfy*, it is to be noted, that this is rather to be called a *symptomatic* disorder accompanying the ascites and anasarca, than a distinct *species* of dropfy<sup>i</sup>." But although it sometimes happens, that the tympany accompanies or follows other dropfies, yet it will appear, from what is

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<sup>s</sup> Serm. X. cap. 20. p. 233.  
Morb. Diuturn. lib. ii. cap. 1. p. 49.  
et Syllemat. Tom. IV. parte iv. p. 425.

<sup>h</sup> De Caus. et Sign.  
<sup>i</sup> Med. Ra-

to follow, that a true tympany sometimes has been found alone. Nay, Hoffman himself in another place<sup>1</sup> says, that it is a different disease, and is produced in the abdomen without any extravasation of water. It is not therefore to be believed, that, when the abdomen on being struck sounds like a drum, water is always present as well as air, and that a paracentesis is proper; for this might lead us into a mistake, as shameful as that mentioned by Helmont: “A certain man was persuaded  
“ by his physician, who thought him dropfical, to  
“ undergo the operation of the paracentesis, in order  
“ to let out the water; which was accordingly performed on the side of the belly, near the navel;  
“ (and I, then a youth, was a spectator of it :) on  
“ the surgeon’s drawing out the instrument again, the  
“ abdomen sunk, and the patient died almost immediately; an extreme fetid blast of wind burst from  
“ him, and the stench of the body was great<sup>1</sup>.”

It is requisite, therefore, that all imaginable care should be used, in examining the symptoms which indicate the existence of a tympany, and distinguish it from an ascites: for even skilful physicians have sometimes been deceived in this matter, and obstinately maintained the disease to be a tympany, when the operation of the paracentesis has afterwards shewn it to be an ascites; and, on the other hand, physicians have sometimes thought they perceived a manifest fluctuation of water lodged in the abdomen, when dissection has afterwards shewn that there was no fluid extravasated, but that the swelling arose entirely from the intestines being filled and inflated with viscidities and flatus. Monsieur Du Verney the younger candidly mentions his mistake in this affair<sup>m</sup>.

In a tympany, the abdomen is never distended to so vast a size, as in an ascites; but is flatter and more compressed towards the sides, and more prominent before. There is no evident fluctuation; and on striking the belly, it sounds like a wet drum, or one that

<sup>k</sup> Ibid. p. 426.

<sup>1</sup> Capit. *Ignotus Hydrops*, p. 416. n<sup>o</sup> 44.

<sup>m</sup> Academie des Sciences, *Pan.* 1703. *Mem.* p. 166.



that is not sufficiently braced<sup>n</sup>. Cambalufier<sup>o</sup> thus defines a tympany: "It is a bag-like tumour of the whole abdomen, hard and resisting, but not sensibly heavy; constantly prominent upwards and towards the navel; sounding when it is struck; and when pressed, immediately rising again; generally attended with eructations, borborygmi, and an obstinate constipation of the bowels arising from flatulency." To these he adds in another passage<sup>p</sup>, That in a tympany, the skin of the abdomen is white, tense, and elastic; that it resists pressure, and quickly rises again; that the form of the belly does not alter on shifting the posture of lying; and for the most part the pulse is harder and fuller than in an ascites, in which it is generally small and languid. But although all these symptoms have a share in forming the diagnostics of this disease, yet the principal are these two, *viz.* if the belly sound from a blow like a drum, and if the patient appear light on being weighed; whereas, in an ascites, the patients are very heavy, on account of the water lodged in the cavity.

But as, according to what was observed, §. 1224. elastic air included in the cavity of the womb (the orifice of the womb being closed) sometimes inflated this viscus; hence it was formerly a received opinion, that a tympany proceeded from air lodged in the cavity of the abdomen: but though this may be sometimes the case, yet dissections teach that it happens but seldom, and that the stomach and intestines greatly distended by rarefied air, lodged in their cavities, cause a tympany. Professor Littre<sup>q</sup> performed the operation of the paracentesis on the bodies of several persons who died of this disease. The abdomen did not sink; and after drawing out the trochar, a candle was applied to the orifice, but the flame was not moved, although the abdomen was pressed on all sides. In a recent tympany he found but very little water in the cavity of the abdomen; and when it was of long continuance, not above three pints; which small quantity

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<sup>n</sup> Ibid.<sup>o</sup> Pneumato-Pathol. p. 23.<sup>p</sup> Ibid. p. 222.<sup>q</sup> Acad. des Sciences, l'an 1713. Mem. p. 315.

tity was not at all answerable to the prodigious distension of it. But he always found the stomach and intestines, especially the large ones, distended, and the colon and cæcum sometimes as big as a man's thigh. Hence he concluded, that a tympany was not produced by air collected in the cavity of the abdomen, but from the inflation of the stomach and intestines. *Sinopeus*<sup>r</sup> also confirms this opinion by his observations: for he tells us, that on pushing the instrument into the belly (most enormously swelled) of a dead body, which a very large coffin could scarce contain, neither water nor air issued forth: and he afterwards saw, in many persons dead of this disease, the intestines prodigiously distended with air, although but a small quantity of water floated in the windings of the guts. *Dr Haen*,<sup>s</sup> professor at Vienna, after enumerating the opinions of various authors concerning the seat of this disease, embraces that of professor *Littre*, inasmuch as he had found in the body of a man, who had had a tympany three years, the colon greatly dilated, so that in some places it was equal in size to the arm, in others to the thigh of a man; and all the smaller intestines, as also the stomach, were twice or thrice as wide as they are naturally; so that, from their being so uncommonly distended, the shape of the thorax was much altered, and both the lungs and heart compressed. But as he communicates his useful labours yearly to the public, this gentleman, not less remarkable for his candour than for his unwearied assiduity, relates also another instance of a tympany<sup>t</sup>, under which a boy six years old had languished for a long time, so as to be swelled sometimes more, sometimes less, but never to be entirely free from the swelling: during the last month of his life, the abdomen swelled to a vast size, and he was costive; however, his belly was not swelled equally all over, but appeared uneven with many bunches, some round and some oblong. The abdomen being cut open after death, no water was found; but the whole swelling was found to proceed from the larger intestines

<sup>r</sup> *Parerg. Medic.* p. 74.  
p. 73, et seq.

<sup>s</sup> *Ration. Medic.* parte ii. cap. 5.

<sup>t</sup> *Ibid.* part 4. p. 59, et seq.

stines being unequally swelled with air, more in some parts, in others less; but they contained an immense quantity of air and of hard fæces. From this instance it appears how the abdomen may be greatly distended in a tympany; but yet not equally all over, as the intestines may be more dilated in one part of their canal, and less in another part; and even a remarkable hardness will be felt near that part where the hardened fæces are lodged, while a flatulent tumour only distends the rest of the abdomen: at the same time, the various situations of the colon, quite different from its natural site (which are frequent in this disease) are worthy of note; as we mentioned before, in the chapter of Wounds.

As, therefore, the most common seat of the tympany, is the stomach and intestines both *crassa* and *tenuia*, sometimes in one intestine, sometimes in several, or in all together; and as accurate experiments teach us, that a tympany, or dry dropsy, often follows inflammatory disorders of the bowels; from hence some places in Hippocrates, otherwise obscure, become intelligible. *Those who are afflicted* (says he) *with gripings and pains about the navel, and a pain in the loins, which are not removed by purges or any other means, fall into a dry dropsy* <sup>u</sup>. For gripes precede, when the intestines are distended by flatulencies: and as the *intestina tenuia*, in their natural situation, occupy the umbilical region, these then seem to be the seat of the disorder; and in fact, the *intestina tenuia* have been found greatly distended in the bodies of persons who have died of this disorder: but the *intestina crassa* also are likely to undergo great changes in their situation, as was said a little above; and the colon has been known to occupy the region of the navel: but when the intestines are greatly distended, the mesentery will of consequence be stretched, if the disorder is seated in the *intestina tenuia*; and the mesocolon, if it occupies the *intestina crassa*. Now we

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know

<sup>u</sup> Quibus tormina, et circa umbilicum labores, et lumborum dolor, qui neque medicamento purgante, neque alias solvitur in hydropem siccum formatur. Aphor. 2. sect. 4. Charter. Tom. IV. p. 18.



know that the mesentery and mesocolon are connected with the loins; and hence it appears, why a pain in the loins, according to Hippocrates, prognosticates a dry dropsy, if by purging or any other means the saburra in the intestines be not evacuated, and the winds expelled, before they have altogether lost their tone. We likewise read in the Coan Prognostics, That a pain above the navel and in the loins, if not removed by medicine, are the fore-runners of a dry dropsy <sup>v</sup>. In this case, it is likely that the seat of the disease is principally in the colon. In another place, he says, That a dry dropsy causes an orthopnoea <sup>w</sup>: for the abdomen being immoderately distended, the cavity of the thorax is straitened; as happened in the case of the boy of six years old, related above. Again, among the symptoms which forewarn us of the approach of a dry dropsy, gripings in the region of the small guts are a bad sign <sup>x</sup>. And a little before we read, Stranguries are a bad sign in dry dropsies; as also urine in which there is but little sediment <sup>y</sup>: for this shews, that the stomach and intestines are so inflated as to compress the kidneys and ureters, and impede the secretion and excretion of the urine; and an ascites frequently also arises from the same cause, as will presently be seen.

Professor Littre <sup>z</sup> clearly explains the manner in which the stomach and intestines may be inflated with air, so as to produce a tympany. The œsophagus always admits the air, and conveys it into the stomach along with the food: perhaps also, when the stomach itself is empty, and suspended from both its orifices, the upper orifices not being quite closed, may give a free passage to the air, which will move freely in the cavity of the stomach and intestines. Of what use the air is in digesting the food, physiologists explain. The air,

<sup>v</sup> Dolor supra umbilicum, et lumborum dolor, si medicamentis non solvantur, in hydropem siccum desinunt. N<sup>o</sup> 305. *Charter. Tom. VIII.* p. 869.

<sup>w</sup> Orthopnoeam facit hydrops siccus. *Ibid.* n<sup>o</sup> 424. p. 877.

<sup>x</sup> In hydropse sicco sui significationem præmittente, tormina circa tenue (intestinum) malum. *Ibid.* n<sup>o</sup> 458. p. 879.

<sup>y</sup> In hydropicis siccis, urinæ stillicidia, mala; malæ etiam urinæ parva sedimenta habentes. *Ibid.* n<sup>o</sup> 453. p. 878.

<sup>z</sup> Acad. des Sciences, l'an 1713. *Mem.* p. 318, et seq.

air, indeed, is expanded by the internal heat of the body; but as the alimentary tube is muscular, it resists its dilatation, and presses together the contents of its cavity. If the abdomen of a living animal be suddenly cut open, the intestines appear solid, sound, and smooth, and scarce seem to have any cavity. In a dead body, the intestina tenuia appear very membranous, and with a considerable cavity; as after death, that muscular force, by which dilatation from the distending air was resisted, ceases; and as the viscera remain warm for some hours after death, the intestines (no longer able to contract themselves by their muscular power) are distended by the rarefied air.

Littre considered the rarefied air, and the contractile force of the intestines, as two opposite powers. In health, this contractile power prevails: if it did not, it is scarce conceivable, how six pints and more of medicated waters, should be drank, and the whole be absorbed by the intestines, without any part of it discharged by stools. But if there be too great a quantity of air pent up in the alimentary tube, or if it be too much rarified, it is expelled by the contractile force of the stomach and intestines, and so passes upwards by eructations, or downwards by flatus. Hence the stomach, which so often receives crude and flatulent food, fermenting liquors, &c. and is even sometimes overloaded with these sorts of things, expels the too copious or too quickly rarefied air, generated by such meats and drinks, by the superior orifice, and so thro' the œsophagus, with a blast. But in the intestina crassa, where the residue of the food is collected (after all the nutritious juices have been extracted from it) together with those things secreted from the humours of the body, and mixed through the whole length of the alimentary tube, there are manifest signs of putrefaction: but it was demonstrated on another occasion, §. 647. that putrescent juices generate elastic air; and hence it appears, why the intestina crassa are most frequently the seat of flatulencies. The intestina crassa are of a greater diameter than the tenuia, have stronger coats, and a triple ligament, which re-

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sists any immoderate distension, and strengthens them considerably through the whole length of their canal, and hence the rectum, when irritated by rarefied air, resists the effort to distend it, and, contracting itself strongly expels the flatus. And how great the force is, with which the rectum contracts itself, is evident from hence, that flatulencies, and even the fæces, are forced out sometimes violently, against the efforts of a strong man.

If now, from any cause, the contractile force of the intestines should be so weakened as to yield to the expanding air, a tympany may be produced. For this reason, a tympany often follows chronic diseases, when the solids are quite debilitated; and likewise after frequent returns of the iliac passion; as appears from the instances alleged above. Before, at §. 960. when we treated of an inflammation of the bowels, we shewed, that the portion of the intestine, which is above the obstructed part, was prodigiously distended, inflated, and dilacerated, with a most acute pain. Now it was proved, at §. 25. that too great a distension of a fibre, and such as approaches to a rupture thereof, leaves after it, as its effects, a great debility: and at §. 1060. among the causes of a palsy, we enumerated a very great and lasting pain; as also, whatever, by straining or distending the nerves, might injure them. It appears, therefore, that the fibres of the intestines may be so weakened by various causes, and the muscular action of their coats be so enfeebled, as that they will yield to the expanding air, and thus be more and more dilated; as has been observed to be the case in persons subject to a tympany.

But although an acute pain often precedes a beginning tympany when this disease follows an inflammation, or at least very troublesome gripings when it is the consequence of some more mild disorder, as appears from the observations of Hippocrates; yet, afterwards, when the intestines have for some time been violently distended, and are no longer able to contract themselves, the muscular fibres of the intestines being rendered paralytic, the pain ceases; in  
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the same manner as, after the most grievous pains of the rheumatism, a palsy coming on, the pain ceases; the nerves being destroyed, or at least so much changed by the disease, that they are become unfit for the exercise of their functions.

Hence also we understand, Why, when a tympany comes to its last stage, no flatus break forth, nor are borborygmi heard: likewise, Why, if there be hopes of a cure, flatus and borborygmi are good signs, as they shew that the intestines have not quite lost, or have recovered, their tone; when such wind will be expelled in great quantity, and the swelling will presently subside: altho' it will return sometimes; till at last, proper remedies having restored the tone of the intestines, the abdomen subsides, and does not swell again.

We have a remarkable case to this purpose in the Medical Essays<sup>a</sup>. A young woman of twenty-two, after a tertian ague, which had been improperly treated, and had lasted seven months, took some doses of the bark; after which she felt acute pains in the loins and abdomen, which generally began near the right os ilium; thence they moved upwards, and, crossing the stomach, passed to the left side. They were attended with gripings and borborygmi; the abdomen swelled, and sometimes rose to a considerable bulk, and then, without any evacuation, gradually subsided, but not entirely. The following winter she was free from these complaints: but they returned in the beginning of the spring; and the abdomen was always swelled, and sometimes to such a size, as gave occasion to fear that it would burst. At last, the tumour gradually lessened, without any evacuation; and then something like balls bunching out in different places was perceived, especially in the side. The appetite was good, there was no thirst, and the urine was in proportion to the quantity drank. Purges were given, the fæces were evacuated, but scarce any flatus, and the swelling of the abdomen remained with very little alteration. Various remedies were tried, both internal and external,

nal, but to no effect. The belly still continued costive and no flatus were expelled. At last she perceived rumblings and borborygmi in the abdomen; some blood was discharged by the anus, (for she was subject to the bleeding piles); and at length she broke wind upwards and downwards so violently, that none of the sick in the same hospital were able to bear it. The abdomen became less and softer; the explosion of flatus continued; and although the swelling returned from time to time, yet at last, by the use of corroborating medicines, she got so well as to be able to bear hard labour. This surprising disease seems to have been a tympany in which the colon was distended through its whole length, and the hard tumours were undoubtedly indurated faeces; for had they been scirrhi, so easy a cure would not have happened. And when the distended fibres of the intestines had regained their tone, the wind was forcibly expelled, the abdomen subsided, and the retained faeces were carried off by purges and clysters, and thus health was restored.

Nor does it seem impossible, that after death the wind may find a vent through the anus, and the swelling in the abdomen subside. Ballonius<sup>b</sup> saw two cases of this kind to his great surprise, in two women “who were dropical, and had their lower belly prodigiously distended partly with water, partly with wind: after they were dead, the belly sunk, and appeared as though there never had been any swelling.” This tympany was seated in the intestines; for if it had been in the cavity of the abdomen, it is scarce possible to conceive that the tumour should vanish after death without bursting the integuments of the abdomen.

From these cases, we may conclude, that a tympany most frequently has its seat in the stomach and intestines, particularly in the larger; yet we cannot deny, that it is sometimes seated in the cavity of the peritonæum: of which the following case is a strong proof, selected from Ruysch, who performed the dissection in the presence of Heister, who certainly could not

easily

<sup>b</sup> Epidem. et Ephemer. lib. ii. Tom. I. p. 176.

asily be deceived in matters of this nature<sup>c</sup>. A woman in the flower of her age died suddenly; as her belly was greatly swelled, it was thought she was pregnant. Her parents and her husband were desirous to have her body opened, in order to discover the cause of her death. When Ruyfch had punctured into the cavity of the abdomen, a great quantity of air issued forth with a sound, and the whole abdomen presently subsided. The uterus was empty, and shrunk up and all the viscera of the abdomen and thorax; were found, except the omentum, which was putrefied; nor could Ruyfch with all his dexterity discover by what way the air could get into the abdomen. Heister, at seventy years of age, asserts, that an abdominal tympany is exceeding rare; for although he had dissected many bodies of persons who had died of a tympany, he never found any air in the cavity of the abdomen, but it was always lodged in the distended intestines.

At this day we certainly know (as was shewn at large in the chapter of Flatus), that air exists in an incredible quantity in the solids and fluids of the body: So long as it remains involved, and coheres with the constituent parts of the body, being divided as it were among the elements of these parts, it is not elastic; but when by increase of heat, by the intestine motion of fermentation, or by putrefaction, that nexus and cohesion of the air with our solids and fluids is dissolved, it recovers its elasticity, and becomes easily dilated by the least increase of heat. Now, as in this woman's body the omentum was found mortified, it is not difficult to conceive, why the abdomen was so much swelled; and why the air, from a slight and small wound, burst forth with noise and violence.

This is the reason why, in diseases of the worst kind, when there is an universal disposition to putrefaction, a tympany comes on, soon followed by death. When we treated of the Putrid Synochus at §. 735. we took notice, that death is at hand, if the hypochondria are tense and inflated. Thus also, in the comment on

§. 1104.

<sup>c</sup> Heister's Medic. Chirurg. und Anat. Wahrnehmungen. p. 28.



§. 1104. when we spoke of the overflowing of black bile it was observed, that the atrabiliary matter when it is putrefied, and (the vascules of the viscera being burst) effused into the cavity of the abdomen, will produce a tympany; for the same reason, the bodies of drowned persons, after having lain some time under water, emerge again, and float upon the surface. At the same time we easily see, that the air may penetrate from the mortified intestines into the cavity of the abdomen; whence, when persons are dying of the iliac passion, the abdomen is inflated: for the same reason, if worms have bored thro' the intestines, an abdominal tympany may take place.

The intestinal tympany is easily distinguished from one of the abdomen by the following signs. If after gripings of the belly and a pain in the loins, the abdomen swells; if there be frequent borborygmi, and the belly very costive; there is reason to suspect an intestinal tympany. If these be wanting, and the tumid abdomen swells suddenly, there is room to fear an abdominal tympany; and in this case the sound of the abdomen will be greater when it is struck. This diagnosis will be more certain, if such causes have preceded as give reason to suspect a putrefaction and mortification of the bowels.

Hence the reason is evident, why a tympany sometimes attends an ascites, namely, when the waters contained in the abdomen begin to putrefy, or the viscera to decay by being long soaked in the waters. Du Verney the younger saw an instance of this, and gives us the signs by which it may be distinguished. As air is lighter than water, it fills the superior part of the the abdomen; and when the belly is handled, a kind of lightness is perceived at that part where the water terminates, and a less degree of resistance, as if one touched a bladder filled partly with air and partly with water; and when the posture of the body is changed, the place of the air and water is changed likewise. He observed besides, that when the operation of the paracentesis was performed, the discharge was some-

times

times impeded by a bubble of air, which it was necessary to break with a hog's bristle to restore the free course of the water. It is however evident, that in such a case the loss of the patient is to be feared, as the only hope in the cure of an ascites consists in the remaining soundness of the viscera.

Such a case is also described by professor Combault<sup>c</sup>, who pronounced, concerning a woman while she was living, that she had a tympany conjoined with an ascites: and after death, he appeared to have judged right; for when the trochar was thrust into the abdomen, which was very prominent, the air presently broke forth with a filthy stench, and with such force as to extinguish the flame of a lamp, and the middle part of the tumid abdomen subsided immediately. The abdomen being opened afterwards, there appeared a great quantity of a thickish fluid, between a yellow or clay colour and a green, in which many hydatides, swelled some with a limpid and some with yellowish liquor, and of various sizes, swam, as also some skins of hydatides which had burst.

§. 1227. **A** D R O P S Y of the testicles, is divided into the following species.

1. A dropfy of the scrotum, which is discerned by the touch; by the visible transparency of the swelling; and by spitting when pressed with the fingers. 2. A dropfy of the bag, formed from the production of the peritonæum in a true hernia: this kind of dropfy attends a violent ascites, and is distinguished by the signs of a preceding ascites, or a tympany; by disappearing upon pressure, when the patient lies upon his back with the upper parts of the body lower than the belly, and by a discharge of water from the abdomen; by the sudden increase and decrease of the swelling without any manifest cause; by the form of

the swelling, resembling a sausage from the scrotum towards the groin. 3. A dropfy of the tunica vaginalis of the testicles, which arises when the humours there secreted are not absorbed by their proper vessels, but stagnate, accumulate, and frequently distend the bladder in which they are contained to an enormous size; or if it be there collected from a rupture or obstruction of the vessels, the inflammation, suppuration, and a collection of ichor, often put on the appearance of this kind of dropfy. But it is known by the tumour not being elastic, nor yielding to pressure; by being hard, and slowly produced; by the absence of those symptoms which attend the first and second kind of hydrocele; by the round, or at least oval figure of the swelling; by a manifest transparency, if the scrotum be drawn tight round it, the dropfical bag exposed to the light of a candle may be clearly seen. Whether, besides these kinds of the hydrocele, there ever is a like swelling between the nervous coat and the substance of the testicle itself, is not certain from observation; but if there be, it can scarce be distinguished from the last-mentioned species, nor perhaps cured but by extirpation. All these disorders come under the general denomination of *υδροκηλαι*, or hydroceles.

Here follows a dropfy peculiar to the male sex, which is commonly called a dropfy of the *testicles*, although it seldom occupies the substance of the testicles themselves, but mostly lodges in their integuments, and principally in the scrotum. But as this is also the common seat of hernias or ruptures, hence if the scrotum be swelled with accumulated water, this disorder is also called a *hernia*; and to distinguish it from other hernias, the epithet *watery* is added: whence all these



watery swellings of these parts were called by the Greeks by the common name υδροηλαι.

But as such a collection of water may take place in different parts, it is worth while to investigate the seat of this disorder; as a different method of cure may be requisite, according to the different part occupied by the water. Hence Celsus treating of these diseases, well observes, *Some symptoms are common, and others peculiar: those are common, by which we discover that water is collected; and those are peculiar, by which we find the place it occupies*<sup>a</sup>. Whence it is necessary to treat of each kind of this disease separately.

1. The first is properly an anasarca of the scrotum, or a collection of water in the cellular membrane of this part; so that all that was said at §. 1225. is applicable here. For under the skin of the scrotum<sup>b</sup> lies a very thin cellular membrane, in which are fixed the bulbous roots of the hairs; under this membrane lies a hollow cutaneous muscle, called *dartos*; most of the fibres whereof pass through this cellular membrane, and adhere strongly to the skin. The concave part of this cutaneous muscle is also lined with a cellular membrane, somewhat thicker than that which is placed between this muscle and the skin; so that, properly speaking, the dartos muscle lies between two cellular membranes. But as an anasarca has its seat in the cellular membrane, the disease may be conceived as occupying either of these membranes: for as they are exceeding thin, have naturally never any fat (being filled with fat only in castrated animals), and a slender, hollow, cutaneous muscle is interposed between them, there is no doubt but that these two cellular membranes communicate with each other, through the interstices of the fibres of this muscle; and therefore both together may be distended with accumulated water in this disease, which is called an anasarca of the scrotum. The seat therefore of this

C c 2 dropfy

<sup>a</sup> Signa utem quædam communia sunt, quædam propria. Communia, quibus humor deprehenditur; propria, quibus locus. *Lib. vii. cap. 18.*

*p. 458.*

<sup>b</sup> Winslow Exposition Anatomique Traite du bas Ventre, n<sup>o</sup> 493, et seq. *p. 562.*

dropfy is in that space which lies between the skin and the tunica vaginalis, of which hereafter; and it occupies both these cellular membranes.

Celsus seems, in some manner, to have been aware of a distinction in this case: for he says, *Nor is the seat of that water which is between the membranes, always the same; for sometimes it lodges between the upper and the middle membrane, and sometimes between the middle membrane and the lowest<sup>c</sup>.* Now an anasarca of the scrotum seems to be the same disease with the hydrocele of Celsus, in which the fluid is collected between the upper and middle membrane, that is, between the skin and the tunica vaginalis; for thus he speaks afterwards: *If the water be lodged between the upper and middle membrane, when we press the swelling with two fingers, the water by degrees slides between them, the scrotum is more lax and whiter; and if it be pulled up, it is stretched either not at all or but little, and the testicle on that side is not perceivable, either by the sight or touch<sup>d</sup>;* for the skin of the scrotum, when the tunica vaginalis is distended with water, will not wrinkle as it does in healthy robust persons.

Authors have multiplied the species of the hernia aquosa; for they have considered that water might be lodged, not only between the tunica vaginalis and the testicles, (of which hereafter, no 3.) but also between that and the dartos. But as it appears, from the observations of that accurate anatomist Winslow, that a considerable cellular membrane lies between the tunica vaginalis and the dartos muscle, the collected fluid may be more likely to cause an anasarca in this place, as this cellular membrane (as we noted above) has a communication with another similar membrane, placed between the skin and the dartos muscle; this slender muscle will be almost imperceptible between these

<sup>c</sup> Ac ne ei quidem humori, qui inter tunicas est, una sedes est. Nam modo inter summam et mediam, modo inter mediam et imam, consistit. *Lib. vii. cap. 18. p. 457.*

<sup>d</sup> Si inter summam mediamque tunicam est, cum digitis duobus premimus, paulatim humor inter eos revertens subit, scrotum remissius est et albidius; si ducitur, aut nihil aut paululum intenditur, testiculus ex parte neque visu neque tactu sentitur. *Ibid. p. 458.*

these two distended membranes; nor does the dartos muscle seem so firm, as that the water should be lodged between it and the tunica vaginalis, as in a hollow bag. The observations of that excellent surgeon Mr Sharp on this subject deserves to be read<sup>c</sup>. If, however, the collected fluid be either naturally acrid, or rendered such by stagnation, it does not seem at all impossible that the cells of this membrane may be eroded, and that by this means the collected fluid may no longer remain in separate cells, but be lodged in a larger cavity. But so long as these cells are entire, this will not easily happen from the weight and quantity of the collected humour, as it does not urge with its whole mass at once, but is lodged in separate cavities, as professor Bertrandi<sup>f</sup> has well observed. This seems to happen, when from a stone lodging in the bladder, or from any other cause, the excretion of the urine is impeded; then by the perpetual violent efforts to discharge the urine the urethra is burst, and the urine diffuses itself through the substance of the scrotum and of the penis<sup>g</sup>. I saw this happen to a youth, who, after several gonorrhœas very unskilfully treated, had the passage of the urethra almost entirely stopped up with caruncles, and the urine had filled the whole cellular membrane of the scrotum, and afterwards had eroded the skin in such a manner in several places, that almost the whole quantity of urine issued through these holes, and scarce any from the urethra. When a universal anasarca occupies the habit of the body, it is not at all strange that the cellular membrane of the scrotum should also be filled with water. However, this disorder has been observed to infest the scrotum more than other parts. A surprising case is related<sup>h</sup> of a man, who, having several times been troubled with an erysipelas of the scrotum and of the feet, at last began to labour under an anasarca of these parts, being in other respects tolerably healthy. Both the scro-

C c 3

tum

<sup>c</sup> A Critical Inquiry into the state of Surgery. f Acad. de Chirurg.  
 Tom. III. p. 85, et seq. g Medical Essays, Vol. V. p. 300.  
<sup>h</sup> Act. Erudit. 1725. Novem. p. 492.



tum and penis had swelled to a prodigious size, inso-  
 much that the scrotum, increased in its dimensions e-  
 very way, hung down to the knees, and, being cut  
 off, weighed together with the penis forty pounds.  
 The skin of these parts was much altered from its na-  
 tural state, being thrice as thick as in common; but  
 the remaining substance of this monstrous mass, was  
 “ composed of innumerable little cells and cavities,  
 “ in which, as in so many membraneous bags, was  
 “ contained a thick gelatinous humour; the like to  
 “ which we also found in the swelling of the feet, the  
 “ skin being cut in various places. With this viscid  
 “ humour the whole scrotum and the integuments of  
 “ the penis were filled; nor did we find any other  
 “ cavities, except those in which the testicles, much  
 “ increased beyond their natural size, were contain-  
 “ ed.” This wonderful instance confirms what we  
 have said above; to wit, that a vast quantity of fluid  
 may be contained in the cells of this membrane, with-  
 out destroying the membranes of these distinct cells  
 and forming one large cavity.

As now the spermatic arteries and veins, together  
 with the vas deferens, contained in what is called the  
 spermatic chord, are arranged in the cellular mem-  
 brane and supported by it, a similar accumulation of  
 water may also happen here, as has been observed by  
 professor *Monro*<sup>i</sup>. Then a soft oblong tumour is per-  
 ceived in the spermatic chord, which is diminished,  
 and even sometimes disappears, on pressure. The  
 form of it alters, according to the different situations  
 of the body: if, for instance, the patient lies down  
 in an horizontal position, and the scrotum be held  
 up, the swelling appears oblong, and almost of the  
 same thickness from the ring of the abdomen quite to  
 the top of the testicle; but if the patient stand erect,  
 and the scrotum be pendulous at the same time, a  
 greater swelling appears in the lower part and a less  
 in the upper. Nay, sometimes also the cells of this  
 membrane, being gradually more and more distend-  
 ed, are changed into encysted tumours, which being

kept

cept in by the cremaster muscles, acquire an oblong figure, and may easily be felt : but the testicle is manifestly perceived under this kind of tumour. Practical observations are then related, by which what was said is confirmed.

2. It is known that hernias of the groin and scrotum are never, or very rarely, caused by a rupture of the peritonæum, but by the peritonæum being stretched and extended into a hollow process, which contains a part of the intestine or of the omentum. Such a bag of the peritonæum will still more easily receive into itself the water contained in the abdomen; as also the air contained in the cavity of the abdomen, when the patient has a tympany. But when the hernia is reduced, and the place supported by a truss, lest the intestine or the omentum should slide down, this process of the peritonæum still remains pendulous in the scrotum; and if there be water in the cavity of the abdomen, it may easily make its way under the truss which supports the groin, and fill the bag of the hernia. Nay, it has sometimes been observed, that although the omentum and the intestine were still lodged in a large bag of the hernia, yet there was besides a great quantity of water. Thus *Monro*<sup>k</sup> from the bag of a hernia of long standing, drew out six pints of limpid serum; after which he could easily distinguish, by the touch, the windings of the intestines, and the unequal surface of the omentum, which constituted the hernia.

It sometimes, although but rarely happens, after the hernia is reduced, that the upper part of the bag closes, so as not to admit any more of the prolapsed intestine or omentum; but yet a small opening remains, sufficient for letting in water flowing down from the abdomen. This was observed by that celebrated surgeon *Saviard*, in the body of a woman who died of an ascites, who had also had a hernia, and a swelling in the groin<sup>l</sup>: there was a bag of the hernia, which, by a very small opening, admitted part of the  
serum

<sup>k</sup> Medical Essays, Vol. V. p. 315.  
<sup>l</sup> Observations Chirurg. obs. 22. p. 120.

<sup>l</sup> Nouveau Recueil

serum floating in the abdomen. We read of a like case elsewhere <sup>m</sup>, in which the author notes, that there was found such a bag of the hernia full of water, whose orifice communicating with the cavity of the abdomen was entirely closed.

But this species of hydrocele is chiefly to be known, from a hernia having preceded, and an ascites being actually present: for, as Mr Sharp <sup>n</sup> has well remarked, an ascites alone will not fill the scrotum with water; and he appeals to all practitioners, whether they ever saw any persons in an ascites, who had an hydrocele at the same time with an ascites, unless the patient had a rupture before. I confess that I have seen many persons in an ascites; and although the abdomen was greatly distended with water, I found that it had made itself a passage into the scrotum, unless a hernia had preceded.

It is easy to understand how this kind of hydrocele, having a communication with the cavity of the abdomen, may disappear upon pressure; may be diminished by a supine position of the body, if the cavity of the abdomen be not entirely filled with water; may increase when the patient is in an erect posture; and the watery tumour itself may resemble a sausage in figure, as the hernial bag when full is of such a form.

It has been observed <sup>o</sup>, that the bladder stretched out into a process, may get through the ring of the abdomen into the scrotum, and cause a hernious swelling; and, when distended with urine, it may deceive unskilful persons by its resembling an hydrocele. But as this generally happens after the urine has been retained a long time; and on pressing such a tumour, the urine comes out by the urethra, and the swelling is considerably diminished, or even sometimes totally disappears; it should seem not very difficult to distinguish a hernious bag filled with urine, from an hydrocele; especially as this disease is now much better known than heretofore, when such a disease as a hernia of the

<sup>m</sup> Le Dran Traite des Operationes de Chirurg. p. 184.  
 tical Inquiry into the present state of Surgery, cap. 2. p. 72,  
 des Sciences, l'an 1713. Mem. p. 147.

<sup>n</sup> A Critical  
<sup>o</sup> Acad.



the bladder was scarce thought of. But as this is not the place for treating of this disease, we refer to what is contained in the Academie des Chirurgie<sup>p</sup>, where the best observations relating to this disease may be found.

3. This is the third and most frequent species of the hydrocele: Mr Sharp seems to reckon this the only one, besides the anasarca of the scrotum<sup>q</sup>. In this case, the water is collected in the membrane called the *tunica vaginalis testis*, which is a continuation of that coat which invests the spermatic chord: for when this vagina approaches the testicle, it is gradually dilated more and more, and consists as it were of two membranous sheaths, of which one includes the other, so that the external sheath is longer than the internal; and there is an interstice between the bottoms of the two sheaths, in which interstice is placed the testicle: the internal coat makes the bottom of the membrane which invests the spermatic chord, and, adhering thereto, forms a partition, which intercepts the communication between the vagina of the spermatic chord, and the tunica vaginalis of the testicle, which is a continuation of the external membrane, and is dilated round the testicle<sup>r</sup>. Water, therefore, may be collected in the sheath of the spermatic chord, of which we spoke before; but that species of hydrocele, of which we now treat, is formed in the cavity of the tunica vaginalis, which surrounds the testicle. Kaau<sup>s</sup> says, that the internal surface of the tunica vaginalis, as also of the testicle and epididymis, perpetually exhale a subtle dew, which, being collected and condensed after death, produces a considerable quantity of moisture. Mr Sharp<sup>t</sup> observes the same. We read of a surprising case described by Monro<sup>u</sup>, of a healthy old man, in whom a tumour of the scrotum was grown to such a size, that it was necessary to prick it, as he would

<sup>p</sup> Tom. II. p. 1. et seq.

Present state of Surgery, p. 65.

Traite du bas Ventre, n<sup>o</sup> 515, 516, 517, p. 564.

Hippocrat. p. 313, 314.

state of Surgery, p. 66.

p. 310, et seq.

<sup>q</sup> A Critical Inquiry into the pre-

<sup>r</sup> Winslow Exposit. Anatom.

<sup>s</sup> Perspirat.

<sup>t</sup> Critical Inquiry into the present

<sup>u</sup> Medical Essays, Vol. V. n<sup>o</sup> 21.

would not allow the bag to be cut off for a radical cure. Some months after, the bag, as is usual, filled again: he deferred the puncture for two whole years, and then the scrotum swelled, not only in the upper, but also in the lower part; nor could the testicle be any longer felt. Outwardly there appeared a different line quite cross, which divided the swelling into two parts: when the lower part was pressed by the fingers, no fluctuation was perceived in the upper part: the scrotum being pierced in the lower part, several ounces of water came out; but the upper part of the swelling did not subside: after some days a fever, accompanied with an inflammation and suppuration in the lower part of the scrotum, followed; and the swelling growing ripe, on cutting the place twelve ounces of pus came out; and it evidently appeared, that this pus was collected in the tumefied substance of the testicle itself. After ten days, the dressings were observed to be wetter than usual; and on taking them off, limpid water came out by drops, and the upper part of the swelling was diminished; and the same dropping continuing, the swelling entirely disappeared, the wound was healed, and the hydrocele never returned.

This instance seems to shew, that the water was lodged in the sheath of the spermatic chord, and hence arose the swelling in the upper part of the scrotum: but afterwards a like collection of water took place in the tunica vaginalis of the testicle, and the water being evacuated thence, the bottom of the sheath of the spermatic chord (no longer supported by the water collected in the tunica vaginalis) breaking, made a passage for the contained water to issue forth.

But as a great and constant perspiration prevails here, that the testicle may be continually fermented with a mild steam; if resorption be hindered by any cause, the water will insensibly be accumulated, and the tunica vaginalis may gradually be distended to a prodigious size, as frequent instances confirm: and the same thing may happen from a rupture of the lymphatics, as was shewn before, when we enumerated the various kinds of Dropsies. I once saw a man of

ixty years old, whose foot slipping while he was making water in the street, he immediately felt an acute pain in the right side of the loins, which soon after went off; but in a short time an hydrocele was formed on the same side, increasing very fast, so as soon to require puncture. It seems probable, that the hydrocele, in this case, arose from a rupture of the lymphatics.

We should be careful, that we do not mistake other tumours for an hydrocele. Which will scarce happen, if we give sufficient attention. For inflammatory tumours of those parts are easily distinguished by the heat, redness, pain, and fevers accompanying them. Purulent and ichorous tumours are known by inflammation or other causes having preceded; and require a discharge of the collected humour, as well as the water, lest the evil should be increased by the delay. Sometimes also the testicle is swelled from a bruise or other causes, becomes hard and rough, and increases to a vast size. This disease is called a *sarcocele*; which, however, is easily distinguished by the touch, from an hydrocele. Sometimes, when the testicle is thus disordered, an hydrocele follows, which, if it grows to a great size, may hide the swelled testicle, so as that it cannot be felt: then the disorder is compound; and the history of the disease will shew, whether the swelling of the testicle preceded the hydrocele. If an exact description of the disease cannot be obtained, on account of the unskilfulness of attendants or patients, puncture may be cautiously used, so as not to injure the testicle; as will be said hereafter, §. 1252. when we treat of the paracentesis of the scrotum.

This disease is then only known when it manifests itself by a swelling; for the very beginning, when a small quantity of serous lymph is collected in the tunica vaginalis, cannot be discerned. For this tumour is not elastic, nor does it yield to the pressure of the fingers, and rise again, as in an anasarca of the scrotum; because the fluid is not lodged in the cellular membrane, but in the tunica vaginalis of the testis. This distinction will be still more certain, if the symptoms



toms of the first and second species of the hydrocele are wanting. As the cavity of the tunica vaginalis is round, it will retain the same figure when dilated; but as it becomes narrower towards the upper part it may, when quite filled, be of an oval form; yet the superior part of it may be so distended by an increased quantity of water, as that the whole may be round. But as both the tunica vaginalis, and the integument of the scrotum, when much distended, are attenuated by the distension, on this account the bag in which the collected fluid lodges will be transparent enough, especially if the scrotum be drawn up cautiously with a soft broad linen rag, that the tension may be increased. But the water contained in such an hydrocele is most commonly limpid; and therefore the whole swelling will be transparent, if a lighted candle be held on the opposite side, so as that the testicle may easily be seen lodging in the middle of the swelling, and care may be taken in performing the operation of the paracentesis not to hurt it with the point of the trochar.

This diagnostic is confirmed by Celsus, who speaks thus: *The swelling is soft if there be not too much water; but if that be increased to a great quantity, it resists to the touch like a bladder filled and bound tight: the veins also in the scrotum are inflated; and if we press the part with the finger, the fluid gives way, and fluctuating raises the part which is not prest; and it is visible thro' the scrotum, as if it were in a case of glass or horn, and is without pain in its own proper substance*<sup>v</sup>. Then after he has added the symptoms by which the first species of hydrocele is distinguished, he goes on: *But if the water be collected under the middle coat, the distended scrotum rises higher, so that the penis above it is concealed under the tumour*<sup>w</sup>. But it is to be noted, that the fluid

<sup>v</sup> Tumor mollis est, si non nimius humor subest; at, si vehementer in-  
orevit, resistitur sicut uter repletus et arcte astrictus: venæ quoque in  
scroto inflantur; et si digitis premimus, cedit humor, circumfluentque  
id quod non premitur attollit, et tanquam in vitro cornuve per scrotum  
apparet, isque quantum in se ipso est sine dolore est. Lib. vii. cap. 18.  
p. 458.

<sup>w</sup> At si sub media tunica est, intentum scrotum magis se attollit, adeo  
ut superior coles sub tumore delitescat. Ibid.

fluid collected in the tunica vaginalis is sometimes not transparent, but turbid and bloody; which is usual in an old hydrocele, when the collected fluid by long stagnation begins to degenerate, and the corroded or macerated vessels let out the blood; the tumour then is not transparent, and greater caution is requisite in performing the paracentesis.

Besides the species of hydrocele already enumerated, some have thought that a watery fluid might be collected between the substance itself of the testicles and their peculiar membrane, which is called the nervous or albugineous membrane, and which is very strong and firm, and most closely adheres to the substance of the testicles. Nay, Winslow<sup>x</sup> is of opinion, that those membranous cells in which the secretory vessels of the testicles are contained and arranged, are processes of the albugineous membrane, which wraps up the testicle. Whence it easily appears, that a fluid cannot be so well collected; and if it were collected thus, the albugineous tunica cannot be distended or divided from the testicle, without the entire substance itself of the testicle being destroyed; which must also happen, if a dropsy were to be formed in the substance of the testicles themselves. Bertrandi<sup>y</sup> well remarks, that no observations are extant, by which the existence of a dropsy of the testicles is so clearly demonstrated, as to remove all suspicion of the waters being lodged in some other seat. Besides, he observes, that in those cases in which this disease was supposed to exist, there flowed forth a humour of such a kind, as shewed that a putrid dissolution, or a real suppuration of the testicle, had preceded.

Certainly an hydrocele of this kind could scarcely be distinguished from the preceding species, wherein the water is collected in the tunica vaginalis, unless perhaps by a most violent pain in the beginning of the disease; that is, the albugineous tunic begins by a slow separation to be divided from the substance of the testicle. But as this cannot happen without destroying at

<sup>x</sup> Exposition Anatomique, Traite bas Ventre, n<sup>o</sup> 486. p. 561.

<sup>y</sup> Acad. de Chirurg. Tom. III. p. 101.

the same time the structure of the testicle, extirpation is the only way left for a cure. It is indeed certain that the testicles have been found macerated, and in manner dissolved, in the water, in an inveterate hydrocele; but there is no certain proof of a real dropsy of the testicles themselves.

§. 1228. **I**T has been observed, that all these diseases arise, 1. From every cause capable so to confine the serous fluid, as that it cannot return into the veins, but stagnates in the distended vessels; 2. From every cause that can so rupture the vessels themselves, as to extravasate the serum between the membranes; or, 3. From every cause which so obstructs the vessels that convey the fluids from the cavities, or so little moves the fluids already deposited in them, that they cannot neither be exhaled nor resorbed.

After enumerating the various species of dropsies, it remains that we now treat of their causes; but as they are so various and numerous, order requires that they be ranged into some more general classes, which will be the subject of this aphorism.

1. We are taught by physiology, that all the lymph which returns from any part of the body, passes from the lymphatic vessels into the sanguiferous veins, either immediately, or through the cisterna lumbaris, the ductus thoracicus, and so on to the subclavian vein. Whatever therefore obstructs the free passage of the lymph into the larger vessels, will occasion it to stagnate in its own vessels, and distend them, and the smallest absorbent veins will not be able to empty themselves; whence the resorption of the exhaling steam from the cavities will cease, while at the same time the exhalation from the arteries into the cavities of the body continues, and therefore a dropsy will ensue. Lower<sup>a</sup> has demonstrated this by direct experiments made upon living animals. He made an aperture in the thorax of a mastiff, and bound the ascending vena cava;

<sup>a</sup> De Corde, cap. 2. p. 123, et seq.



ava; then he sewed up the wound. The animal presently grew faint, and expired in a few hours. On dissecting the dog, a great quantity of serum was found coating in the abdomen, just as if he had long laboured under an ascites. He tied very tight the jugular veins of another dog; after some hours all the parts above the ligature swelled surprisingly, and in two days the animal died, as if he had been suffocated with an angina. All the muscles and glands above the ligature were greatly distended with a limpid serum. Here we see that an ascites arose in a few hours, from an obstruction of the motion of the venous blood. In the body of a girl of eight years old<sup>b</sup>, who died comatose, and oppressed with a difficulty of breathing, from water being collected in the ventricles of the brain, the cavity of the heart was found full of watery serum a little tinged with red, but a perfectly limpid humour was found in the brain. When the dissector had quite freed the breast from the contained humour, he found the lungs unimpaired; but he discovered two abscesses, and two hard fleshy tumours as big as a pigeon's egg, which compressed the descending trunk of the vena cava: and without doubt they were the occasion of the accumulation of watery serum in the head and breast.

In pregnant women, if the distended uterus presses the iliac veins, the legs and thighs are affected with a dropical tumour, and sometimes even the parts of generation swell with a true anasarca: but as soon as this compression of the veins ceases after delivery, the swelling entirely disappears in a few days. From these and the like instances, Hoffman and other eminent physicians have asserted, that the slow motion of the blood through the veins, is the true cause of the excessive swelling of the body in a dropsy, and of the separation of the serum from the blood<sup>c</sup>. Hence also we see the reason, why in the beginning of a dropsy (as was observed in the commentary on §. 1230.) the feet first begin to swell;

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<sup>b</sup> La Motte Traite complet de Chirurg. Tom. II. p. 186. <sup>c</sup> Med. Rat. System. Tom. IV. partiv. cap. 14. p. 431.

swell; because gravity increases the difficulty of the return of the blood through the veins in the lower limbs, especially in those who live a sedentary life and scarce use any motion. Whence, also, tall men are thought to be more liable to dropfies than others<sup>e</sup> for the difference of stature depends principally on the greater or less length of the legs and thighs: for the distance from the top of the sternum to the os pubis, does not vary considerably in men of different stature, as the viscera of the thorax and abdomen require nearly the same space in all men; but the difference of stature depends chiefly on the different length of the head and neck, and above all of the lower limbs.

In tall men, therefore, the venous blood has a long way to ascend against the resistance of gravity; and therefore, *ceteris paribus*, the feet of such persons will most easily swell. Professor de Sauvages<sup>e</sup> has excellently remarked, that the fluids in a healthy state have a certain degree of viscosity by which they adhere to the sides of the vessels; and by this the force of gravity is lessened, when they are to ascend almost perpendicularly. If now such a cachexy has arisen, as that firm good blood is no longer produced, but the fluids degenerate into a watery thinness, this adhesion to the sides of the vessels is diminished, the power of gravity continuing the same; wherefore, in this case, the lower limbs will easily swell.

We may equally understand from hence, why, if any obstruction arises near the right venous sinus, in the pulmonary artery, or in the lungs themselves, so as that the free passage of the blood through this viscus be impeded, there is room to apprehend a dropfy: for the two trunks of the vena cava cannot, on this supposition, empty themselves freely; whence the motion of all the venous blood will be retarded. Hence it so often happens, that persons afflicted with polypous concretions about the heart and the larger vessels, die dropfical. For the same reason, asthmatical persons often become dropfical; which Aretæus<sup>i</sup>, when he is treating of this disease, remarks: “ Some

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<sup>d</sup> Ibid. p. 436.

<sup>e</sup> Dissertation sur les Medicamens, p. 12.

patients in this disease perish soon, when some violent disorder attacks the whole habit: in others, the disorder terminates in an ascites or an anasarca<sup>f</sup>." And Aëtius, although according to the opinion which prevailed in his time he says, " Unless the liver become cold, it is impossible the water should stagnate<sup>g</sup>;" and consequently ascribes all dropfies to the cooling of the liver; yet soon after he adds what follows: " We have known some who have fallen into a dropfy from that kind of asthma, in which the patient can scarce breathe but in an erect posture, and which is therefore called an orthopnoea."

Nor is it strange that the ancients should imagine disorders of the liver to be the causes of all dropfies, as this viscus is so frequently found impaired in the dead bodies of dropfical persons, the ascending trunk of the vena cava passes through the liver, and the vena porta is distributed through the whole substance of this viscus. For any tumour being formed in this viscus, may impede the return of the venous blood. But the obstacle to the free motion of the blood thro<sup>u</sup> the veins being removed, the extravasated liquid may be resorbed, and, so re-absorbed, be evacuated by the proper channels from the body. Whence Hippocrates says, *A dropfy is cured when the water passes through the veins into the belly<sup>h</sup>*; which passage we took notice of on another occasion, §. 719.

2. If the free circulation of the venous blood be obstructed, the lymphatics will be distended; if this distension be increased, they may burst and pour out their fluid into the cavities of the body. Many authors indeed deny this cause of a dropfy; and others think it is very seldom, if ever, the cause of this disease<sup>i</sup>. Lower<sup>k</sup> found in sheep, who had died of a dropfy of the breast and abdomen, the lymphatics full, and e-

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<sup>f</sup> De Causis et Signis Morbor. Diuturnor. lib. i. cap. 12. p. 41.

<sup>g</sup> Serm. 10. cap. 20. p. 233.

<sup>h</sup> Ab hydropse detento, aqua secundum venas in ventrem fluente, solutio. Aphor. 14. sect. vi. Charter. Tom. IX. p. 255. et Coac. Prænot. n<sup>o</sup> 461. Charter. Tom. VIII. p. 879.

<sup>i</sup> Monro on the dropfy, p. 20.

<sup>k</sup> De Corde, cap. ii. p. 124, 125.



ven turgid; infomuch that he recommends such bodies to anatomists preferably to others, for most easily demonstrating the lymphatics: but this could not be, if the lymphatics were burst. However, if it be considered that the thoracic duct has been broken, which is the largest vessel that conveys lymph, and is hence reckoned as it were the vena cava of the lymph, there seems no room to doubt, but that the smaller may sometimes break. Nay, the same ingenious author<sup>l</sup>, who had denied that a dropsey ever proceeded from a rupture of the lymphatics, relates a case of a man, from whose thorax a large quantity of chylous fluid was taken, and in whom the thoracic duct was found perforated near the third or fourth vertebra of the thorax. He likewise owns, that on tying the thoracic duct in live animals, he had sometimes found the receptaculum chyli or some of the larger lacteals burst. But diseases might produce the same effect with the ligature; as appears from the following case. A boy of two years old, after a peripneumony which had been improperly treated, remained sickly, with a cough and a difficulty of breathing for a year; then a quotidian intermittent came on, with a dropical swelling of the abdomen daily increasing, the cough and asthma increased, an atrophy wasted the body, and the child sunk at last under so many ills; but the face kept its bloom, and the appetite was good to the hour of his death. Morton<sup>m</sup> foretold his friends they would find his disorder to be a true chylous dropsey, from the chyle being extravasated into the cavity of the abdomen, the chylous vessels by some accident being burst: for he had seen, on performing the paracentesis on the boy while alive, that there came out several pints of sweet milky chyle, such as is found in the chyloferous duct. On opening the body, he found the lungs in a sound state; “ except, that on the back part of the thorax, behind the aspera arteria, there appeared a great number of glands, of a considerable size, and hard, “ which

<sup>l</sup> Monro on the dropsey, p. 22.

<sup>m</sup> Phthisiologia, lib. i. cap. 10.

“ which caused a great pressure on the thoracic duct,  
 “ nearly in that part where it joins the subclavian  
 “ vein; and they were of so great a weight and size,  
 “ that the pressure on the thoracic duct straitened it  
 “ almost as much as if it had been tied up with a  
 “ bandage, and made it next to impossible that the  
 “ chyle should pass from thence into the blood.”

If besides this we reflect, that the lymphatics have very thin coats, and even when filled with their proper fluid are so pellucid as to escape the sight of superficial observers; and besides, that these vessels are of no very inconsiderable size, so that (see §. 1215.) there has been found in the kidneys a trunk of a lymphatic half as thick as the quill of a pen; it will appear, that it is far from impossible, that such slender vessels, turgid with their contained fluid, should sometimes be ruptured, pour out their lymph, and produce a dropsy. For a very great quantity of lymph may issue from the wounded lymphatics. This Ruyfch<sup>n</sup> confirms by an instance. A surgeon had opened a venereal bubo, before it was ripe; and unhappily cut a lymphatic, from whence such a quantity of lymph issued daily as to wet the rags upon the wound. Dressings being put under the part affected, and kept tight with clasps, the motion of the lymph through the ascending lymphatics was obstructed, and this discharge was stopped. I have sometimes seen, after venesection, a very troublesome oozing of lymph last a long time. So that it appears, that a rupture of the vessels may be reckoned among the causes of a dropsy, although the following cause is much more frequent.

3. We have already often remarked, that the greater and smaller cavities of the body in a healthy man, are full of a very subtle steam; which, on opening the abdomen of a healthy animal, reeks forth in a thick cloud, in winter-time especially, and is dispersed in air. This vapour seems to be reſorbed by the small veins before it condenses into water; as in living animals the whole surface of the viscera is indeed.

deed found moist, but no fluid is found collected in the cavities till after death: for this dewy steam is exhaled with some force from the arteries, and the same impetus seems to urge it inwards to the patent mouths of the small absorbent veins. But if the vital powers, which urge on the circulation of the fluids, be languid, this vapour will issue less impetuously from the arteries, and be pressed less forcibly into the absorbent veins. For this reason, weakly constitutions are liable to dropsies, which seldom attack robust and vigorous persons. Whatever therefore weakens the tone of the vessels, disposes the body to a dropsy. Thus Hippocrates<sup>o</sup> observed, that when the prevailing constitution of the year was soft and moist from southerly winds, many persons fell into dropsies: for nothing more weakens the solids than a moist warm vapour; as was shewn before, in treating of the Diseases of the Solids.

Whenever the strength of the vessels is weakened, they act less upon their contained fluid, and become less capable of converting the chyle into blood of a good and firm texture. Hence the red part of the blood fails in quantity; and as this part is the most dense, the whole mass of fluids becomes too thin, and the body grows cachectic: then, if the too attenuated fluids are excreted from the body, a marasmus ensues; if they remain in the body, they are collected in its cavities, and bring on a leucophlegmatia or a dropsy, as was said in the commentary on §. 1170.

But as those bodies which have firm vessels and plenty of red blood, have also the greatest heat, they will be less obnoxious, *ceteris paribus*, to dropsies, and rather incline to acute inflammatory diseases: but when this heat is diminished, the exhaling steam will condense into a watery fluid, fill the cavities, and with difficulty be reformed. Hence we so often find the thighs and legs of dropical persons as cold as marble; and therefore, as will be said hereafter when we treat of the Cure of this disease, physicians lay so much stress on frictions of the parts which are swelled, not only

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<sup>o</sup> Epidem. lib. iii. Charter. Tom. X. p. 259, 263.



put the stagnating humours in motion, but also that the heat arising from frictions may rectify the extravasated fluid again into a steam, and render it more easily to be resorbed. Before, at §. 44, when we treated of the diseases of Lax and Weak Viscera, it was remarked, that the force with which the small orifices of the veins imbibe the effused fluid from the cavities of the body, increases or decreases in proportion to the strong or languid circulation of the blood. It was remarked at the same time, that in extreme languors the evacuating power of the arteries seemed to last longer than the absorbent power of the veins; for which reason there is almost always found some quantity of a fluid in the cavities of the body after death.

But when water abounds in the fluids, and is not exhaled from the body by the cutaneous pores, or carried off by the urinary passages, the quantity is increasing continually, and that of the other fluids diminishing.

Thus, in a confirmed dropsy, the abdomen and the lower extremities swell prodigiously, while the upper parts shrink and waste away; and the vessels contain but little blood, so that their sides almost collapse.

But there is another cause, from whence the superfluous fluids are effused into the cavities of the body, and give rise to a dropsy. At the first view it should seem, that water, which is thinner than the red blood, should easily pass from the extremities of the sanguiferous arteries into the veins: and thus Dr. Hales<sup>p</sup> thought that warm water injected into the arteries, would thoroughly wash out all the thickest blood from all the blood-vessels, as well from the veins as from the arteries. But the event did not answer his expectations: for the water did not return by the veins, but escaped through those small arteries, through which the red blood could not pass into the void interstices of the cellular membrane; and compressed by its weight the neighbouring arteries, and still more the veins which made less resistance to it. He concludes from this experiment, that the last order of capillary sangu-

guiferous arteries had so great a contractile power that their extreme orifices could not be kept open by the water flowing through the vessels, but required a circulation of an uninterrupted series of red globules to keep the passage open from the extremity of the artery into the vein which lay contiguous to it. Elsewhere he has demonstrated, that it is not sufficient for life that the arteries and veins remain full of water after the blood is let out, for hereupon the animals died. At the same time, when he persisted to inject water through a tube fixed to the carotid artery, although the jugular veins were cut longitudinally, the water did not issue freely by these apertures; but all the parts of the body began to swell, and an universal dropsy took place; the lungs were distended, all the muscles grew turgid, all the interstices between their fibres being filled with water: yet the water was not propelled through the arteries with a greater force than the power of the heart in its natural state.

Hence the reason appears, why the increase of water alone, in the blood, may dispose the body to a dropsy.

But when the water in the cavities of the body comes to such a quantity, as that it begins greatly to distend the containing membranes, it is then scarce possible that it can be rarefied so as to become again a vapour; sometimes by long stagnation it grows as thick as a jelly, and thus can by no means be re-sorbed. Besides, when the veins are beyond measure distended by the collected water, although it may perhaps be thought that at the same time the orifices of the absorbents are equally dilated, yet the ramifications of the veins are so much compressed by the surrounding fluid, that they can no longer transmit any thing, and by this means the difficulty of resorption will be increased. Add to this, that, in a dropsy of long duration, the sides of the cavities, in which the fluids are lodged, become incruited with a slimy matter, by which the mouths of the veins are stoppt up. This

This often happens, more especially in the incysted dropfy, as dissections have shewn, and we have remarked before.

These are the three general causes of a dropfy: it now remains that we consider those morbid changes of the body which usually precede one or more of these, and thus give rise to the dropfy consequent upon them.

. 1229. **T**HESE causes are chiefly such as follow, namely, An hereditary disposition. Too sudden and copious drinking of cold liquors, which are neither discharged by stool, urine, vomit, or sweat, by heat and motion excited. Acute diseases, especially fevers of the ardent kind, whether they be attended with intense thirst, or not. A dysentery from diseases of the spleen. Obstinate obstructions of the viscera; such as a scirrhus of the liver, spleen, pancreas, mesentery, kidneys, uterus, and intestines. A jaundice. A violent and obstinate quartan ague. A hientery, diarrhæa, and a dysentery of long standing. The coeliac passion. An empyema. A phthisis. The gout. All profuse evacuations, especially of arterial blood. Drinking of acrid and fermented liquors. Hard, viscid, and tough aliments. Large and numerous hydatids, pendulous in the cavity of the abdomen. And many like causes; as, Melancholy, the scurvy, &c.

An hereditary disposition, &c.] It is evident, from a variety of instances, that diseases descend sometimes from parents to their children; as was observed on other occasions, §. 1075. Therefore it will not appear strange, if children sprung from dropfical parents have reason to apprehend the same disorder themselves; and, according to the usual effects of fear of future evils, that they should eagerly snatch at vain remedies. Hence, (as was before observed also of a phthisis), of old, when



when the bodies of dropfical persons were burft, the children fat with their feet in water; for, by the means it was believed the difeafe would be prevented from being tranfmitted to their children<sup>a</sup>. The people of Antwerp, in Van Helmont's time, were of opinion, that " unlefs all the water were drawn out of the corpf, the dropfy would pafs to the next heir " and therefore they were follicitous for the cutting " open the body : " this perfuafion of the people had at leaft this good confequence, that frequent opportunities were afforded to phyficians of examining the dead bodies of dropfical persons, that they might fo much the better investigate the caufes and effects of this difeafe. It was faid before, that persons of a weak, flaccid habit, were moft liable to this difeafe. Now as the offspring of fuch persons are generally infirm, we eafily perceive a reafon why an hereditary difpofition fhould be enumerated among the caufes of this difeafe.

[Too fudden and copious, &c.] This is no unfrequent caufe of the dropfy, efpecially in camps, when foldiers, tired and heated with hard labour, greedily drink large draughts of cold liquors, and reft themfelves prefently afterwards. Draughts of cold water, taken when the body is heated, either by the weather, or by violent exercife, have often been the caufe of fudden death, or of acute difeafes; and if the perfon efcapef thefe, there is danger that he fuddenly falls into a dropfy. In fome difeafes, drinking very cold water is of fervice; as we mentioned when we fpoke of the cure of the Iliac Paffion, Hæmoptœ, &c. But prudent phyficians give cold water in fmall quantities, and at intervals, fo that it may have time to be warmed in the ftomach, and afterwards diffufe itfelf equally over the whole body. For when cold liquor is drank under thefe regulations, and the patients lie well covered up in bed, a gentle heat, diffufing itfelf even to the extreme parts, ufually follows, with a copious fweat all over the body, by which the water abounding in the blood is exhaled.

But

<sup>a</sup>tarch de his quæ fero a numine puniuntur, Tom. II. p. 558.

But when, the body being heated, large draughts of water are swallowed down without any moderation, and men repose themselves after it without being covered so as to keep themselves warm, no sweat follows, and sometimes the urine is discharged in very small quantities, and all the water that is drank remains mixed with the blood. Now from Hales's ingenious experiments, formerly mentioned, it is evident that a large quantity of water being suddenly thrown in upon the blood, it does not pass from the extreme arteries into the veins, but is deposited, by the more subtle secretory branches of the arteries, in the cavities of the body, and soon produces an universal dropsy. This chiefly happens to those who presently repose themselves after drinking cold water: if they continued to move about briskly, the muscles acting strongly and continually would hinder the water from lodging in the cellular membrane, which is every where spread over the muscles, and fills up their interstices: besides, as the body grows warm by motion, the water keeps moving on, and passes off both by sweat and urine; or, if it too violently oppresses the body, is thrown out by vomiting, or discharged along with the stools.

Further, when the stomach is suddenly distended by cold liquors being drank, the motion of the body having before heated the liver which lies close upon the stomach, and the sudden chill affected this viscus, may bring on an hepatitis, and its effect a schirrhus of the liver, as was said before, §. 916. But we shall see presently, that a dropsy frequently arises from a schirrhus of the liver; and therefore, from a double cause, a dropsy may follow a too hasty and eager drinking of cold liquors when the body is heated; either suddenly, the water swallowed remaining in the body; or more slowly, in consequence of the liver being previously affected. But as the ancients held the refrigeration of the liver to be a primary cause of the dropsy; and thought this distemper might arise from this alone, without any preternatural tumour of the liver, although they well knew that a schirrhus of the



liver often preceded a dropfy; Aëtius ſays as follows:  
 “ The body is attacked by a cutaneous dropfy, from  
 “ refrigeration alone primarily affecting the liver  
 “ which afterwards becomes ſometimes hard alſo; as is  
 “ evident in thoſe who, from an unſeaſonable drinking  
 “ cold liquor, ſuddenly chill their liver ſo as to cauſe  
 “ dropfy, before this viſcus ſwells into a ſchirrous tu-  
 “ mour.<sup>b</sup>” Aretæus has given a moſt excellent deſcrip-  
 tion of this ſudden dropfy: “ A dropfy alſo ſometimes  
 “ comes on ſuddenly from a too plentiful drinking of  
 “ cold water, when, urged by vehement thirſt, a per-  
 “ ſon greedily ſwallows his fill of cold water, and the  
 “ liquor paſſes to the peritonæum, and from thence  
 “ the natural warmth of the cavities of the body is  
 “ cooled; and then drops of water are poured in the  
 “ flanks, which before paſt off in the form of a va-  
 “ pour by perſpiration. The diſeaſe is more eaſy to be  
 “ cured in this caſe, than after any viſcus is injured,  
 “ or the whole habit poſſeſſed by it<sup>c</sup>. Hippocrates  
 principally condemns ſtagnant rain-water; and ſays,  
 that a dropfy of the whole habit may ariſe from the  
 incautious drinking of it: *When any one in ſummer time,  
 after a long journey, lights on ſtagnating rain-water,  
 and greedily drinks large quantities of it, if the fleſh  
 imbibes and retains it, and it be not any way evacuated,  
 theſe diſeaſes ariſe<sup>d</sup>.* Then he adds this remark: *If  
 the perſon who has drank the water continues to walk,  
 no bad conſequences may follow; but if he reſt from walk-  
 ing, and the evening has gone down, it will ſoon bring  
 on grievous diſorders<sup>e</sup>.* On another occaſion, at  
 §. 1051, n<sup>o</sup> 1. I gave ſome remarks on this ſubject: but  
 we are here treating of a ſudden dropfy from copious  
 draughts of cold water. As to ſtagnant water, as of  
 pools and marſhes, if it be uſed for common drink,

Hippo-

<sup>b</sup> Serm. 10. cap. 20. p. 233.

<sup>c</sup> De Cauſis et Signis Morbor.

Diuturnor. lib. ii. cap. 1. p. 50.

<sup>d</sup> Quum quis per æſtatis tempus ex longo viæ itinere in aquam plu-  
 viam et ſtagnantem inciderit, eamque avidè copioſam biberit: ſi igitur car-  
 nes aquam ebiberint et in ſe continuerint, nuſquam autem ſceſſus fiat,  
 hæc contingunt. *De Intern. Affect. cap. 28. Charter. Tom. VII.*

<sup>e</sup> Hic interea ſane ſi incedat, nihil mali videtur habere; quum autem  
 ab inceſſu ceſſarit, ſolque occiderit, conſeſſim multum laborem exhibet.  
*Ibid.*



Hippocrates has remarked elsewhere <sup>f</sup>, that it will likewise produce dropfies, and those sometimes of the most fatal kind, even though such water be not taken in large quantities at once: But he does not there speak of a sudden dropfy, which is less fatal than those which take place in consequence of some disease of the viscera; for he says, *Many dysenteries happen in summer, and diarrhœas and obstinate quartan agues. Now these diseases, in length of time, bring mortal dropfies on persons of such constitutions.* Nay, he ascribes a dropfy of the womb to the use of standing water.

Acute diseases.] Celsus, treating of this disease, says, *It often comes on of itself, and often in consequence of some other disease which has been of long standing* <sup>g</sup>. We have already spoken of the first species of dropfy: it remains, that we see after what other diseases a dropfy commonly follows.

Acute diseases, &c.] Although acute diseases, especially those of the ardent kind, seem to be of a quite opposite nature to a dropfy; as they are attended with a burning heat, a dryness of the mouth, tongue, nostrils, &c. symptoms very different from those observed in a dropfy: Yet it must be remarked, that in acute diseases the more fluid parts are dissipated, and the grosser so strongly united, that they can scarcely be attenuated, even by plentiful draughts of water, or even be miscible with it, but pass off from the inspissated blood either by morbid sweats or urine. Whence, as has been frequently observed before in the history of Inflammatory Diseases, physicians reckon it an ill portent for thin watery urine to be discharged in acute diseases: for it is observed, that the blood sometimes acquires an almost pitchy tenacity when deprived of its most fluid parts. Whence, among the causes of melancholy, §. 1093. were enumerated “burning fevers, lasting long, frequently returning, and going away without a good crisis, and

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“with-

<sup>f</sup> Æstate dysenteriaz multæ incidunt, et diarrhœæ, et quartanæ febres diuturnæ. Hi autem morbi producti ejusmodi naturas ad hydropas deducunt, et perimunt. *De Aere, locis, et aquis. Charter. Tom. VI. p. 195.*

<sup>g</sup> Sæpe hoc malum per se incipit, sæpe alteri vetusto morbo supervenit. *Lib. iii. cap. 21. p. 161.*

“ without diluting remedies.” Sometimes an insatiable thirst accompanies such diseases: sometimes, altho’ all the causes which excite thirst subsist and are very vehement, the patient being delirious takes no liquor. In the first case, while the disease is in full vigour watery liquors drank in the greatest quantity are put in motion by the fever, and expelled by various passages from the body: but the cause of thirst still remaining, and the patient continuing to dilute copiously, the disease now declining from its vigour, and the strength broken by the violence of the preceding disorder, the watery liquors will not move briskly enough thro’ the vessels; they will separate from the too inspissated blood, will become collected in the larger cavities of the body, and by this means a dropsy will be formed. But in the other case, when patients are labouring under the most ardent diseases not sensible of thirst, the blood will grow exceeding dense; and it will be difficult for the water to be intimately mixed with it afterwards, when in the decline of the disease the patients begin to recover their senses, and eagerly to desire drink. Add to this, that such a viscid blood will be most apt to form the worst kind of obstructions in the viscera: from whence, as we shall presently see, a dropsy may arise. See to this purpose also what has been said already, at §. 1050. *et seq.* of chronical cases which owe their origin to disorders remaining after acute diseases not well cured.

A lasting dysentery from diseases of the spleen, &c.] Before, at §. 958. when we treated of the disorders of the spleen, it was remarked, that a dysentery was of advantage in splenitic disorders, if it did not last too long; that is, when the morbid matter which stuffs up the spleen, becoming liquid, passes through the splenic vein into the liver, and thence into the intestinal canal. If, after the morbid matter is evacuated, the dysentery ceases, and the strength returns, this is an excellent sign: but Hippocrates, as we then said, thought a long dysentery a bad sign in persons who had diseased spleens: and said, they terminated in a dropsy, or a lientery, ending in death. For in this case



case, the dysentery is not the effect of the dissolved morbid matter seeking an issue from the body; but rather of a putrefaction in the bowels, and of fluids too thin and acrid.

Obstinate obstructions of the viscera, &c] This is very frequently the cause of a dropsy, insomuch that few dropsies occur, in which one or more of the viscera are not found schirrhous; except those which arise from profuse discharges of the blood, or from drinking large quantities of cold water.

It often happens, that after the water has been discharged by the operation of the paracentesis, schirrhous masses may be perceived, by the touch, residing in the abdomen. Numerous instances may be found to this purport, in the writings of those who have made collections of medical cases. I have seen not a few in bodies dissected, and principally in the liver; so that we need not spend our time in proving this, more especially as schirrhuses of the viscera, and their fatal effects, have been spoken of before in the chapter of Inflammatory Diseases, and also very particularly in the chapter concerning Schirrhuses. But as it appeared at the same time, how difficult the cure of a schirrhus was, no one will wonder that physicians should almost despair of entirely curing a dropsy, when there are schirrhuses in the bowels. Hence Aretæus said, with good reason, "It is not very easy to discuss a schirrhus in the spleen; and if diseases, such as a dropsy or a cachexy spring from this origin, the patient labours under an incurable disorder<sup>h</sup>." And the same may certainly be pronounced of schirrhuses in the other viscera. For either, by their great size pressing on the neighbouring veins, they may hinder the return of the venous lymph; which is principally to be feared in the liver, as the great vena porta is distributed through that viscus, and the ascending vena cava passes through it, (whence also a rupture of the distended vessels may be apprehended :) Or else the functions of the viscera, which assimilate the crude aliments, being impaired, the whole body will become cachectic;

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<sup>h</sup> De Curat. Morbor. Diuturnor. lib. ii. cap. 14. p. 128.



chetic; from which cause a dropſy may equally ariſe: Or from a like cauſe the re-aſorption of the fluid which perpetually exhales from the arteries may be ſtopt; ſo that from ſchirrhuſes of the viſcera only, all thoſe things may be produced which are apt to cauſe a dropſy, and which have been enumerated in the preceding paragraph.

Phyſiology<sup>i</sup> ſhews us, that the texture of the omentum is ſuch, as to be moſt apt for reſorbing the lymph, and to mix it ſo reſorbed by the paſſage of the two epiploic veins to the blood of the vena portarum before it flow through the liver; therefore, if the omentum be diſeaſed, this reſorption will be impeded.

It has appeared already, from numerous obſervations, that the omentum has been found decreaſed in ſize, ſo as ſometimes to be entirely wanting, or to have but a very ſmall portion of it left. Sometimes, although more rarely, it degenerates wonderfully from its natural ſtructure; a remarkable inſtance of which profeſſor Monro<sup>k</sup> found in the body of a woman who died of an aſcites; and like obſervations are to be met with in Ruysch and others.

It is however to be obſerved, that in an encyſted dropſy of the abdomen, after the water has been diſcharged by tapping, the bag ſhrinks up, and reſembles, to the touch, a hard ſwelling, which diſappears when the bag is again diſtended with new water: and after death, in the part where phyſicians thought there was a hard ſchirrhouſ tumour, no ſuch thing has been found.

A jaundice.] In an obſtinate jaundice the liver often becomes ſchirrhouſ. Beſides, (ſee §. 950.) if the bile remains long in the blood, it ſo diſſolves and thins the red part of it, that ſcarce any craſſamentum is left; whence an incurable dropſy, after a long-continued jaundice.

A violent and obſtinate quartan ague.] See §. 753: where we treated on thoſe morbid alterations produced by intermitting fevers; where we likewise remarked from Sydenham, that dropſical ſwellings of the legs were

<sup>i</sup> H. Boerh. Inſtit. Medic. ſect. 331.  
Vol. IV. p. 428, &c.

<sup>k</sup> Medical Eſſays,

were not always bad symptoms after intermittents, but shewed that some portion of the febrile matter was deposited in these parts; therefore he did not treat this complaint like a dropsy, but by medicated wines composed of bitters, aromatics, and corroborants.

A lenteria, diarrhœa, &c.] Sometimes the watery serum collected in the cavities of the body, and absorbed by the veins, is discharged by stool. In this case, all these evacuations are beneficial, as they carry off the morbid matter; and afterwards the relaxed parts, where the collected water lodged, as also those through which it flowed, may be so strengthened by bracing remedies, that health may be restored. Hereafter, when we treat of the Cure of the dropsy, it will appear that physicians sometimes endeavour to promote these discharges by art. Thus Aretæus remarks, "That a dropsy is sometimes happily changed into this complaint, from one disorder indeed into another, but the change is for the better<sup>1</sup>: And elsewhere, treating of the dysentery, he says, "Sometimes a great quantity of water is discharged from the relaxed intestine (the colon), and thousands have been freed from the dropsy by this means<sup>m</sup>."

But these diseases then become remedies, when the strength is increased at the same time that the water is discharged from the body; as Aretæus has well distinguished, when he discourses of the dropsy following a diseased liver. His words are: "If nature recovers her former strength, she sometimes purges off violently the morbid matter through the belly: After discharging much thick and watery matter, she also gets rid of the dropsy. But this kind of natural remedy has its danger likewise; for after sudden and copious evacuations, and the vessels greatly collapsing, the patients sometimes perish from entire loss of strength." Hence also we understand, why Hippocrates thought it portended ill, *if in those patients, in whom the dropsy begins in the flanks and loins, the feet swell, and obstinate diarrhœas seize them, which neither*

*re-*

<sup>1</sup> De Causis et Signis Morbor. Diuturnor. lib. ii. cap. 10. p. 63.

<sup>m</sup> Ibid. cap. 9. p. 61.



*remove the pains in the flanks and loins, nor soften the swelling of the belly*<sup>n</sup>. And Galen well observes, in his commentary on this place, that το λαπαττειν does not signify an evacuation by stool, when there is a diarrhœa of long standing, but the decrease of the swelling of the belly.

All these purgings therefore, if, coming on after dropfy, they expel the water from the body, and the strength return at the same time, are of service; but when, these having preceded, the body, already rendered weak and cachectic, begins to swell with a dropfy, things are in a bad way. See what was said before at §. 721. concerning a leucophlegmatia and a dropfy following a diarrhœa.

An empyema, a phthisis.] For the texture of the fluids being dissolved by the pus absorbed into the circulation in the last stages of these diseases, the extremities of the body begin to swell, especially if the nocturnal sweats cease, the strength be sunk, and the thirst be great; for then the liquors drank cannot be freely circulated through the body, and hence the extremities will swell. See §. 1206.

The gout.] Partly because the gout often follows the intemperate use of wine and other spirituous liquors; which intemperance is one cause of the dropfy, as will presently appear: Partly because long fits of the gout confine the patients to their beds; and as many joints of the body, especially in the lower limbs, have almost lost their power of motion, the patients can scarce stir about, even when they are free from pain. Hence a deficiency of muscular motion, which produces a laxity and weakness of the fibres, (see §. 25.); and this debility has a tendency to produce a dropfy, as was shewn at §. 44. Add to this, that by long lying on the back (in a fit of the gout) the kidneys are hurt so often as to breed the stone, by which the free secretion and excretion of the urine is impeded; and (as we shall see under the next paragraph,) that making but little water is not only an effect, but some-

<sup>n</sup> Si quibus ab ilibus et lumbis principia sunt hydropum, pedes tumant, et diarrhœæ diurnæ detineant, quæ neque dolores ex ilibus ac lumbis obortos solvunt, neque ventrem molliunt. *Prognost. Tom. VIII. p. 620.*



sometimes is also the cause of a dropsy.

All profuse evacuations.] Before, in treating of the causes of a Cachexy at §. 1168. it was remarked, that in order to obtain a perfect assimilation of the fluid, it was requisite that a small quantity of crude aliment should be mixed with a great quantity of the natural fluids: if therefore, by immoderate evacuations of any kind, a great quantity of sound humours are discharged from the body, the crude aliment will not be duly assimilated, a universal depravation will follow, together with a cachexy, of which a dropsy is the consequence.

But a dropsy is most especially to be feared after great evacuations of arterial blood from wounds, or after miscarriages, delivery, &c. For the red part of the blood is the firmest and most dense, and best fitted to produce and to sustain the natural heat: the other parts of the blood are thinner, and escape from the larger vessels by more subtle lateral branches; they are accumulated in the larger and smaller cavities of the body, and have not sufficient warmth and motion to cause them to be exhaled from thence, or to be reformed. For from Hales's experiments above related, it appears, that whenever the blood, in a living healthy animal, is too much diluted, a dropsy quickly is the consequence. This too great dilution of the humours, the observations of Hippocrates likewise confirm to be a cause of dropsies: his words are, *This happens, if a woman drinks profusely to quench her thirst; and at the same time the evacuations by stool and urine are not made in the proper quantities, and the diet be improper: and if she becomes dropsical, the menses flow in large quantities suddenly (sometimes their quantity is but small,) and sometimes they are coloured only like water in which bloody flesh has been washed, (sometimes they are a little higher coloured), and they do not coagulate*°. And in another place,

° Si sitim mulier minime temperet, neque vesica, neque alvus, tum urinam, tum stercus, ut æquum est, transmiserint, neque idonea utatur homo victus ratione. Quod si hydropica fuerit, copiosi menses repente, quandoque etiam pauci, prodeunt, et nonnunquam velut aqua ex carnibus fiunt, ut si quis cruentas carnes abluerit, interdum etiam paulo for-

place, where he is treating of the curable and incurable dropfy, he says, *If there happen a large effusion of blood upwards and downwards, and a fever accompany this discharge, there is great reason to apprehend a dropfy: the progress whereof will be speedy, and the issue fatal*<sup>P</sup>. This therefore may be established as a certainty: that a diminution of the red part of the blood, whether it be gradual as in cachexies, or sudden as in wounds, disposes the habit to a dropfy.

Drinking acrid, fermented liquors.] By an immoderate use of spirituous liquors the abdominal viscera harden and become schirrhus (§. 28.), which cannot be cured by medicine: now obstinate obstructions of this kind, are among the causes of a dropfy.—But intemperate drinkers are liable to dropfies on another account. For while they indulge in generous wine, the body is heated, the blood rarefied, and all the vessels grow turgid, and by being so often overstretch'd lose their tone; (see §. 25, n<sup>o</sup> 3.) And as great thirst ensues on excesses of this kind, they swallow great quantities of watery drink, which increase the debility, and cannot receive a sufficient degree of motion from the relaxed vessels to be dissipated from the body; hence they collect and stagnate in the cavity of the body. This is principally to be feared by those who, repenting of the shameful folly of intoxication, abstain not gradually, but all at once, from all fermented liquors, and fall by that means into a very pernicious languor. See what was said on that head, §. 605, n<sup>o</sup> 11.

Hard, viscid, &c.] See §. 25 and 26. and also §. 1168, of bad diet, as one cause of a cachexy.

Large and numerous hydatides.] Of these we treated at §. 1226.

And many like causes.] For all those diseases which greatly sink the vis vitæ, may be causes of a drop-

fortiores, neque concreſcunt. *De Mulier. Morb. lib. i. cap. 61. Charter. Tom. VII. p. 762.*

<sup>P</sup> Cui vero multum sanguinis sursum et deorsum eruperit, et febris in super accesserit, eum aqua repletum iri multa spes est; atque hic hydrops brevissimi temporis est, et ex quo paucissimi evadunt. *Predict. lib. ii. cap. 5. Charter. Tom. VIII. p. 814.*

dropsy; and likewise those which render the blood so viscid, that it can scarcely be diluted with watery fluids, nor intimately combined with them; as is evident from the whole history of Melancholy. And in the description of the scurvy, §. 1153. the thickness of the blood constituted one part of the proximate cause. Besides, these diseases have many common causes with the dropsy, as is plain from what has been said at §. 1093. and 1150.

. 1230. **T**H E effects therefore and progress of the disease are geneaally such as follow. The feet swell, especially towards the evening; this swelling gradually increases and spreads. Then the abdomen swells, and daily grows bigger; which, in a tympany, when struck, will sound like a drum; in an ascites, when the water floats freely in the cavity of the abdomen, a fluctuation is perceived upon moving the body; but in an encysted dropsy, this symptom fails. Next follow a dyspnœa; thirst; weight; corpor, costiveness; little urine; a slow fever; no sweats; a leanness which increases in proportion to the largeness of the swelling in the affected parts. Then appears an anasarca of the thighs, scrotum, and skin of the abdomen; hydatides; an acrimony of the water stagnating, and putrefied by being confined in a warm, close place; ulcers; gangrenes; a bleeding at the nose; umbilical ruptures; a sphacelus of the viscera; and, at last, the death of the patient.

It will be worth while to consider how and with what symptoms this disease begins and increases.

[The feet swell, &c.] If the disease take its origin simply from a watery thinness of the fluids, the tumour begins where the ascent of the venous blood is most difficult: So that the swelling first appears about the ankles,



ankles, because shoes bind the feet themselves so much, that they cannot easily swell. But if the dropfy arises from schirrhi of the bowels, or from ruptured vessels, then the abdomen swells before the feet and swelling of the feet often comes on late in an ascites; especially if the collected water be lodged out of the cavity of the abdomen, as was said at §. 1226. This swelling is mostly perceived towards evening, because in the day-time the person being either erect or sitting, and not moving his body much, the fluids could not easily ascend: nay, it is observed in men healthy in other respects, that the lower limbs swell more or less towards evening; so that strait shoes are most uneasy at that time. But such a swelling of the feet, in the beginning, by the horizontal posture in sleep, and the warmth of the bed, is dispersed so as to be quite unperceivable in the morning, and returns again in the evening. As the disorder gradually increases, the swelling rises higher, and does not disappear again any more in the night-time.

But it is to be observed, that every swelling of the feet does not indicate a dropfy: for in the beginning of a scurvy, (see §. 1151, n<sup>o</sup> 2.) the legs swell also; but this scorbutic swelling does not feel soft and doughy, but resists the pressure of the finger more. Nor do there remain those pits, which Hippocrates has thus described as a sign of the dropfy, under the name of the *ileum*, in those whose diet has been hot and moist, and who have not used exercise, but have commonly slept on a full stomach: *If you press any part with your finger, you will make such an impression as will leave a mark as it would on dough, and this will principally appear if you press the feet*<sup>a</sup>. But, as was observed under the foregoing aphorism, sometimes after acute diseases there is a humour separated from the blood, deposited in one or both feet, to the manifest relief of the patient; and then by motion, frictions, taking the air in fine sun-shiny weather, and using corroborating

<sup>a</sup> Si digito partem aliquam comprimas, impressionem facies, et sibi vestigium apparebit, quemadmodum in farina aqua subacta, maxime autem in pedibus cavitas imprimitur. *De Intern. Affect. cap. 46. Charter. Tom. VII. p. 671.*

ating remedies, such swellings are dispelled which at first might be thought dropfical, as they are altogether like the swelling in an anasarca. Celsus also seems to point out this, when he says, *Water under the skin is not very dangerous, if it has not taken rise from any preceding disease; nor even that which follows in a long disease, if the viscera be sound and the breathing easy, if there be no pain,*<sup>b</sup> &c. Then after enumerating all the functions, and supposing them unimpaired, he concludes, *So that where all the functions are in this good state, there is no danger; where most of them are so, there is good reason for hope*<sup>c</sup>. For in such case the swelling increases pretty fast, till all the morbid matter being deposited on the extremities, the viscera are quite freed from it. But in the beginning of a dropfy, the swelling gradually increases, and the other symptoms follow successively, shewing that the viscera are not disburdened by a transferring of the morbid matter to other parts, but that the swelling is a consequence of the viscera being impaired by diseases. *When dropsies arise from diseased livers, a cough and an urgency to coughing attacks the patients; they spit but little; the feet swell; the belly is costive, and the stools, when they have any, hard; and swellings shew themselves about the belly, which have their inclination partly to the right and partly to the left side*<sup>d</sup>.

Certainly Sydenham<sup>e</sup>, who so attentively watched diseases in their very origin, accounted pits left on the impression of the finger in the lower part of the legs, principally conspicuous towards night, and disappearing again in the morning, as the first symp-

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<sup>b</sup> Aqua inter cutim minime terribilis est, quæ nullo antecedente morbo cœpit: deinde quæ longo morbo supervenit; utique si firma viscera sunt, si spiritus facilis est, si nullus dolor, &c. *Lib. ii. cap. 8.*

<sup>c</sup> Si quidem in quo omnia hæc sunt, is ex toto tutus est; in quo plura ex his sunt, is in bona spe est. *Ibid.*

<sup>d</sup> Quibus vero ab hepate hydropes fiunt, tussis et tussendi cupiditas ipsis innascitur, nihilque effatu dignum exspuunt, ac pedes tument, venterque non deiecit, nisi et dura, et ad necessitatem, et circa ventrem tumores prodeunt, qui partim ad dextra, partim ad sinistra, tum consistunt, tum desistunt. *Hippocr. Prognost. Charter. Tom. VIII. p. 621. Coar. Prænot. n° 452. Ibid. p. 878.*

<sup>e</sup> Tractat. de Hydropæ, p. 608, 609.



toms of a dropſy. He cautions us, however, that this is not a ſure ſymptom, “ Unleſs they who have  
“ this ſwelling breathe with difficulty; and in this  
“ caſe the ſwelling increaſes in ſize every day, till  
“ the feet not being able to admit any more water  
“ the legs ſwell, and afterwards the abdomen it  
“ ſelf.”

But although, for the moſt part, the feet ſwell in the beginning of a dropſy, yet the ſwelling does not begin in the lower parts; for, as we have already obſerved, frequently in an hydrocephalus, a dropſy of the thorax, and an aſcites, the feet either do not ſwell at all, or not till towards the end of the diſeaſe, when a confirmed dropſy has filled the cavities of the body with water. Nay, it ſhould ſeem from the obſervations of Hippocrates, that a dropſy ſometimes begins in the face itſelf, and deſcends from thence towards the lower parts; for thus he deſcribes the diſeaſe which he calls *cratium*, and indeed its fourth kind, which is a true dropſy, and which he adviſes to be treated in the ſame method by which we attempt the cure of a dropſy: *This diſeaſe ariſes from white phlegm, and occupies the belly after long fevers have preyed on the body. The diſeaſe begins from the face; and the face ſwells: thence the ſwelling deſcends to the belly; where, when it is arrived, it diſtends it to a vaſt ſize; and the body languiſhes, as oppreſſed and tired out with ſupporting its burden. There is a weight and a great pain in the belly, and the feet ſwell<sup>f</sup>. Then he adds a wonderful ſymptom which he had obſerved in this diſeaſe: If the rain have wetted the earth, the patient cannot bear the ſmell of the duſt; and if he ſtand ſtill in the rain and ſmell the earth, he preſently falls down<sup>g</sup>.* On another occaſion, (§. 1210.) I took notice of that

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<sup>f</sup> Hic morbus a pituita alba fit: in ventre vero colligitur, ubi febres diutiffimæ corpus occuparint. Hic morbus initium ſumit a facie, et facies tumet: deinde ad ventrem deſcendit; quo quum pervenerit, ventrem in magnitudinem attollit, corpusque velut a deſatigatione ſuccumbit. In ventre pondus eſt et dolor vehemens, et pedes intumeſcunt. *De Intern. Affect. cap. 52. Charter. Tom. VIII. p. 676.*

<sup>g</sup> Si pluvia in terram effuſa fuerit, pulveris odorem non ſuſtinet; ſi vero in pluvia forte conſtiterit, et terræ odorem ſenſerit, mox concidit. *Ibid.*



onderful smell which the earth emits when wetted by rain.

Then the abdomen swells, &c.] That is, if the water begin to be gradually collected in the cavity of the abdomen: for if the watery serum is collected only in the adipose membrane, as it is in an anasarca, then the abdomen is not more swelled than the other parts of the body; as the water is not collected in its cavity, but universally under the skin.

But we discussed sufficiently the diagnostics of a tympany, and of a simple ascites, under §. 1226.

A dispnoea.] That is, when the free expansion of the lungs, from the air drawn in, is impeded. If the abdomen be filled and distended with water, this will hinder the free descent of the diaphragm in inspiration; whence the dilatation of the thorax becomes difficult. But this will be still more the case, when the cavity of the breast is filled with water as well as that of the abdomen. And, in an universal anasarca, there is room to fear that the cellular membrane of the lungs may be affected in like manner, as was said, §. 1220. Whence a difficulty of breathing is very justly accounted a bad design in a dropsy; because it is either the consequence of an extreme fulness of the abdomen from an ascites, or gives cause to fear that the thorax and lungs are affected with the same disorder.

On the same account also a cough is reckoned a bad sign in this disease, as it equally shews the functions of the lungs to be disturbed by the quantity of the collected water, or that they are perpetually irritated even by a smaller quantity of water grown acrid, as was before observed, §. 1219. Hence Hippocrates says, *A cough coming on in dropsies is a bad sign*<sup>h</sup>. Gallen<sup>i</sup>, in his commentary on this aphorism, remarks, that the cough is then principally a bad symptom, when the cause of it is the increase of the dropsy; but not when a dropical person is accidentally teized with a cough from some other cause: for it may be produced

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<sup>h</sup> Hydropicis tussis succedens, malum. Aphor. 35. sect. 6. Charter. Tom. IX. p. 270.

<sup>i</sup> Ibid.

ced by a catarrh, or by other causes. In another place Hippocrates seems not to pronounce a cough simply to be a bad symptom in this disease; but says, *If a cough constantly afflicts a dropfical person, the disease is incurable*<sup>k</sup>. Here he uses this phrase, *ἡ βηξίς* ("o" "if a cough hold him,") which seems to indicate that constant dry cough in dropfies; whereas, perhaps, in the other passage, he intends a slighter cough just in its beginning.

[Thirst.] In treating of febrile thirst, we enumerated the causes; as, dryness, an imperviousness of the fluids, saline acrimony, &c. Now all these concur in a dropfy, if the disease has been of long standing; for dropfical persons are not very thirsty in the beginning. When the watery serum is collected in the cavities, it does not return by the veins, nor is again mixed with the blood. Hence the blood is daily more and more deprived of its most fluid part, and rendered less capable of circulating through the vessels. At the same time, from this defect of moisture, the secretions of the finer juices are diminished; whence the skin becomes dry, and the tongue and mouth are parched; and while the belly alone is increased in size by an ascites, all the rest of the body withers with a marasmus. Neither will copious drinking quench the thirst, because the liquids drank will not readily unite with the too much exsiccated blood, but soon escape from the vessels into the dilated cavities of the body. For now the skin no longer perspires, and the urine is discharged in very small quantities, as we shall see presently: hence the liquor taken in remains in the body and increases the dropfy, but does not remain in the vessels through which the fluids circulate. Hence it may truly be said of dropfical people.

*Quo plus sunt potæ, plus sitiuntur, aquæ :*

The more they drink, the more they still desire.

And the collected lymph is salt and brackish; and, by long

<sup>k</sup> Hydropicum si tussis detineat, desperatus est. *Aphor. 47. sect. 7.*  
*Ibid. p. 317.*

long stagnation in the cavities of the body, becomes more and more acrid, subputrid, and almost alkaline. Add to this, that dropfical persons are costive, and therefore the excrements long restrained in the primæ viæ become putrid. It is evident, therefore, that there are many very efficacious causes of thirst in this disease.

Weight; torpor.] Dropfical people are overwhelmed with the mass of water, their strength is much impaired, and they are scarce able to move their unwieldy body. If we reflect besides, that a sufficient quantity of animal spirits cannot be secreted from blood so vitiated, another reason will occur, why the body feels heavy, and why dropfical patients are inactive and indolent. Add to this, that sometimes water is collected in the ventricles of the brain, whence the patients sometimes die lethargic; and that the blood, deprived almost of all its lymph, circulates with difficulty through the vessels of the brain, whence all the animal functions may be disturbed, and that in various ways. This also seems to be confirmed by the observations of Hippocrates, when he tells us, “that if epileptic fits attack dropfical persons, they are fatal<sup>1</sup>.”

Costiveness.] When the abdomen is distended by a great quantity of water, the intestines are compressed, and the fæces accumulated and hardened in the intestina crassa. Add to this, that in dropfical persons the chylopoietic viscera are frequently schirrhous, and clogged with obstinate obstructions. Now all these viscera bear a part in forming good bile, as physiology shews; and among the uses of the bile this is one, to promote the alvine excretion: whence, if the bile be deficient in quantity; or if, from the powers of the viscera being impaired, it wants its due qualities; it is easy to see how this cause also may produce costiveness. Hippocrates excellently enumerates all these symptoms of a dropfy: *When persons fall into a dropfy from some other disease, they are costive; and their excrements are voided in small round balls like pills, and resembling goats dung, with a mucous slime; and the urine not laudable; and there are tensions about the hypochondria,*



dria, and pains and swellings about the belly, and pains about the soft part of the sides and near the muscles of the spine; fevers also, and thirst, and dry coughs, come on, with a difficulty of breathing on motion, and a weight of the legs; and they lose their appetite, and feel a fulness from a small quantity of food<sup>m</sup>. The belly is so sluggish, for the most part, in dropical persons, that when the cure of the disease is attempted by purges, a double and sometimes a triple dose of cathartics is necessary to procure stools.

Little urine.] While the watery serum is accumulated in the cavities, it is plain that but little urine can be secreted from the blood already deprived of its watery parts. It is equally certain, that a great quantity of thin watery drink will be discharged from the kidneys, unless by strong exercise, or the warmth of the air, the person being heated expels by sweat the water superabounding in the blood: this is very evident in those who drink great quantities of mineral waters. Whence also, in summer, the urine is observed to be less copious, when much fluid is perspired through the skin; and *vice versa*, in the cold of winter. At the same time it has been observed, that when a larger quantity of urine is discharged suddenly by nature, or by the help of art, dropical swellings are not only diminished, but sometimes entirely removed. Van Helmont considered this; and, resolved to let slip no opportunity of pouring forth invectives against the schools of physic, (being a hater of all the ancient physicians, but chiefly of Galen), would have it that the seat of all dropies was in the kidneys. He sneers at the ancient physicians, who maintained the cold temperature of the liver to be one cause of dropies; and affirms that he had dissected several bodies of dropical patients, and had never found any fault

<sup>m</sup> Quibus ex aliqua ægritudine ad hydropem res devenit, his alvi siccae excrementa caprini stercoreis pilulis similia deſiciunt, cum eliquatione mucosa, et urina non bona: et distensiones circa hypochondria, et dolores ac tumores circa ventrem, et dolores circa laterum mollitudinem, et juxta spinæ musculos, accidunt; febres quoque, et sitis, et tusses siccae, sequuntur; et circa motus spirandi difficultas, et crurum gravitas, et a cibis abstinent, et paucis ingestis expleantur. *Ibid.* n<sup>o</sup> 481. p. 880.

fault in the liver but once. From whence he concluded, "In a dropfy, the efficient archæus of the kidneys, conceiving an idea generated from his perturbation, shuts up the kidneys, and a dropfy is produced<sup>n</sup>." And elsewhere, "The kidneys actually form and contain the dropfy; but the abdomen, by the governing action of the kidneys, provides it a lodging. The kidneys send a stream from their own seat thither: for the fluid is not furtively snatched away as it were by another viscus, but the kidney alone banishes the fluid from itself to the part subjected to its government<sup>o</sup>." Whence he concludes<sup>p</sup>, "Therefore a true ascites is in the kidneys, and to loosen the obstinate fastening of the kidneys is to cure the dropfy." Wherefore if this perturbation of the idea in the archæus of the kidneys were set right, he thought the dropfy might be cured; for thus he speaks: "Some authors recommend live toads bound to the kidneys on each side of the back, in order to cure the dropfy by a discharge of urine. I have at least seen a dropfical peasant cured, by tying the flough of snakes on the belly and loins: for an idea of fear is raised in the kidneys, by which they lose their indignation. In the same manner thirst excites an idea of sorrow, or of an unsatisfied desire, by which means the kidney forgets its indignation<sup>q</sup>."

The followers of Van Helmont's wonderful dogmata were astonished at the sagacity of their master, who had found out that the causes of all dropfies were in the kidneys; and exclaimed in the public schools, that no one before Van Helmont ever thought of this. However, it is certain that the ancient Greek physicians acknowledged a diminution of the secretion by urine, as a cause and sign of a dropfy about to come on; and thought it a bad sign, if the dropfy were already formed. Certainly Hippocrates has said, *In bilious persons, a purging, with small stools resembling semen, mucous, and attended with a pain near the os pubis,*

<sup>n</sup> In capitulo, *Ignotus hostes morbus*, sect. 70. p. 399.  
<sup>o</sup> In capitulo, *Ignotus hydrops*, sect. 20. p. 411.

<sup>p</sup> Ibid. sect. 19. p. 412.

<sup>q</sup> Ibid. sect. 36. p. 415.



bis, and a discharge of urine not coming readily, (so think *ευλυτως* should be rendered), end in a dropsy<sup>r</sup>. And soon after, *A small quantity of turbid urine is a bad sign in a dropsy attended with a feverishness*<sup>s</sup>. Aëtius, treating of a hardness or schirrhous of the kidneys, says, “The patients make but little water, and their habit of body resembles that of persons labouring under an anasarca; and some of them in time fall into a manifest dropsy<sup>t</sup>.” On the other hand, Aretæus held a copious discharge of urine the best remedy for a dropsy: for treating of the diabetes, he calls it a species of dropsy, differing only in this, that in a diabetes the water flows out of the body, and is not collected in the cavities as in a dropsy; and adds, “A discharge by the same passages comes on in a dropsy, if the disease tends to a cure<sup>u</sup>.” But since (as we shall hereafter see in treating of the cure) the drawing out the collected water from dropfical persons is almost always of service, if it be performed cautiously; but does not however cure the disease, unless the cause can be removed; hence Aretæus prudently adds, “This is good if the cause be removed, and not only the burden taken off.” But as the ancients saw that the whole body was withered, and dried up with a marasmus, while the dropfical parts alone increased in bulk, they said that every thing liquefied and turned to water. Thus Galen said, *There happens a kind of division in the elements, (ανασχοιχωσις), or colliquation, or dissolution, (or whatever else any one shall chuse to call it) sometimes of the whole body, sometimes of the fluids in the veins only. And this colliquament sometimes rushes to the belly, sometimes issues forth by urine or by sweat. And the fluids in the veins being dissolved to ichorous serum, the kidneys formed to draw this secretion to themselves*

<sup>r</sup> In biliosis alvus turbata, dejiciens parva genituræ similia, mucosa, et dolorem circa pubem inducentia, et urinæ non expedite prodeuntes (*ευλυτως*) ex talibus in hydropem desinunt. *Coac. Prænot.* n<sup>o</sup> 455. *Character.* Tom. VIII. p. 878.

<sup>s</sup> Hydropico febrienti urina pauca et turbata perniciofa est. *Ibid.* n<sup>o</sup> 456.

<sup>t</sup> Serm. xi. cap. 17. p. 270.  
b. ii. cap. 2. p. 129.

<sup>u</sup> De Morbor. Diuturn. Curat.



lves (especially when they are sound) purge off the serum from the veins, and send off a flux thereof to the bladder perpetually. But when the kidneys are no longer capable of attracting this fluid, the veins evacuate this serum into the belly, or distribute it to the whole habit of the body, and sudden dropsies are brought on<sup>v</sup>.”

How well is this opinion of Galen's confirmed by the experiments of the present age! At first sight it would seem extremely probable, that the blood, broken down into a watery serum, would easily pass thro' the secretory ducts of the kidneys, and increase the quantity of urine: but to the secretion of the watery serum from the blood, by the structure of the kidneys, a brisk motion of the red blood through the larger vessels is requisite; which if wanting, either from a defect of the red part in the blood, its crasis being too much attenuated, or on account of the strength of the vessels being diminished, the secretion becomes defective in the kidneys; or, according to Galen's phrase, *non trahunt renes*, “the kidneys do not draw.”

Hales<sup>w</sup> made a curious experiment, which entirely confirms what we have just now said. Cutting open the jugular veins of a dog, he, by a tube inserted into the artery, washed out with warm water all the red blood: when the animal was dead, and while the body was yet warm, he opened the abdomen and thorax. Then he inserted a larger brass tube into the descending aorta, that the warm water might freely enter the artery at such a height, that the pressure of the incumbent weight might be equal to the force which urges on the arterial blood. While the warm water was thus moved thro' the arteries, he fomented the

<sup>v</sup> Fit igitur quædam quasi in elementa divino (*ανατοχειωσις*) vel colligatio, vel dissolutio, aut quomodocunque quis aliter nominare voluerit, aliquando totius corporis, aliquando humorum qui in venis sunt, adtaxat. Atque hujus colliquamentum alias ad ventrem confluit, alias ad urinas, alias ad sudores pellitur. Ac humoribus, quos venæ continent, in serosam saniem resolutis, renes ad excrementum id trahendum nati, potissimum quum sani sunt, serum quidem a venis expurgant, fluxionem autem ad vesicam assiduo mittunt. Ubi autem renes trahere non valent, venæ ejusmodi serum in ventrem mittunt, aut, toti id corpori partientes subitaneos hydropum status inducunt. *Lib. iii. de Symptom. Causis, cap. 8. Charter. Tom. VII. p. 99.*

<sup>w</sup> Hæmaestat. *Exper. xiv. p. 118, et seq.*

the body constantly by pouring on it warm water, and covered it with clothes wet with warm water, and sometimes dipped the whole body in warm water. Yet, after all these precautions, no part of the warm water passed through the kidneys into the ureters and bladder, altho' the kidneys were swelled to hardness with water.

Does it not appear from hence, that Van Helmont said nothing new, when he said, the secretion of the urine being obstructed, was a cause of the dropsy? The old physicians, from a careful observation of this disease, knew and wrote the same. I have before taken notice, that many things, which are admired in this extravagant author, are found better expressed among the ancients. Galen said simply, "The kidneys do not draw the watery serum." Did Van Helmont say better, when he affirmed, that the archæus of the kidneys, in indignation, threw aside the reins of government over his proper fluids? Does he seem wise when he believes, that tying live toads, or the slough of snakes, to the reins, terrifies the archæus, and brings him to a better disposition, so as that he will duly perform his old functions?

A slow fever.] Although in the beginning of a dropsy the whole body is cold and languid, and the dropsy seems to be a disease quite foreign to a fever; yet a fever commonly attends a dropsy of long standing; partly from a putrefaction of the stagnant fluids; and partly from the blood being deprived of its diluting lymph, which, escaping from its proper vessels, is collected in the cavities of the body. On this head, see what is said at §. 586, no 5. when treating of the causes of a fever. On which account Aëtius, discoursing of the dropsy, says, "They loath food; but most of them are desirous of plenty of drink, especially those who have an ascites: for the humour lodged in the cavities is brackish and putrid, wherefore the thirst and fever increase; for almost all dropical persons are feverish\*."

No sweats.] That the fluids may pass thro' the ex-

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remities of the minute arterial vessels of the skin, it is necessary that the skin should be soft and warm; but in a dropsy the swelled legs and thighs are as cold as marble, while the parts not immediately affected are almost dry and withered. There are great hopes of a cure, if dropical people sweat, either spontaneously, or by art, as it is a sign that the extravasated serum is resorbed, and circulates again through the vessels. Hence physicians, as will be said hereafter, sometimes attempt the cure by sudorifics. But they grieve to find the truth of what was long ago said by Aretæus, " Their body has no moisture; wherefore they do not grow moist with sweat, even in warm baths y."

Emaciation.] Unless that which is wasted, both in the fluids and solids, by the action of the healthy body itself, be restored by wholesome nourishment, the body would be consumed by a true marasmus. The very best aliment requires the action of all the viscera and vessels, as well as a sufficient quantity of sound juices pre-existing in the body, that what is wasted may be repaired. But the blood in a dropsy is deprived from its natural qualities, and the viscera are compressed by the water collected in the cavities of the body: hence the exercise of their functions is impeded; and nutrition is so much the more defective in those parts which are not swelled, as the dropical parts are more distended and turgid. Whence Hippocrates says, *And if a dropsy follow from evacuations being suppressed, the belly swells, as also the feet and legs; but the shoulders, clavicles, breast, and thighs, are wasted*<sup>z</sup>. And Aëtius<sup>a</sup> also, with good reason, accounts this emaciation of the upper parts, a bad sign. Indeed all inveterate dropsies, which have already impaired the habit, are dangerous.

Then appears an anasarca of the, &c.] These disorders generally follow an ascites of long duration, when

y De Causis et Signis Morbor. Diuturnor. lib. ii. cap. 1. p. 50.

z Et si quidem hydrops ex purgationis defectu oriatur, venter aqua impletur, pedes et tibiæ attolluntur; humeri vero, claviculæ, pectus, et femora, contabescunt. *De Affect. cap. 6. Charter. Tom. VII. p. 626.*

a Serm. x. cap. 20. p. 234.



when the ascending vena cava and the iliac veins are compressed by the water in the cavity of the abdomen. But then the anasarca of the lower limbs increasing ascends, and extends under the skin of the abdomen. Besides, from the daily increasing distension of the skin, the subcutaneous sanguiferous veins are pressed; hence, whatever exhales from the arteries into the cellular membrane can no longer be resorbed by the veins; hence the cellular membrane will begin to grow turgid. In persons who have an ascites, large sanguiferous veins are visible in the skin of the abdomen, full of black blood, which surgeons, in performing the paracentesis, cautiously avoid, especially if the operation be to be performed in the scrotum. See also what was said of an anasarca, §. 1225.

[Hydatides.] Of these frequent mention has been made already.

[Acrimony of the water, &c.] It is known, that our fluids have a tendency to putrefaction; but so long as they circulate through the vessels, and those particles which are most corruptible are excreted from the body, all putrefaction is hindered in a living person. But when the fluids stagnate long in the cavities of the body, putrefaction is to be apprehended: which is longer before it begins, if the cavities be closed; but much speedier, if access be once given to the air. Perhaps this is the reason, as will be said hereafter in treating of the cure of a dropsy, why the drawing the water from the belly, by portions at a time, has often been attended with ill success: for the air having gained admission, putrefaction is remarkably accelerated. Nay, it has been observed, that water drawn out by tapping, at first shewed no signs of putridity; but that after it had been exposed for a few hours to the air, it stunk abominably. Although the water will grow putrid in any cavity of the body, yet this will sooner happen when an ascites occupies the cavity of the abdomen, than in other dropsies: for from the newly opened abdomen, even of a healthy person, there reeks forth a vapour, of smell something like urine, and having somewhat of a stench. The abdominal viscera are per-

etually agitated by the motion of respiration: the bile, which approaches nearest to putridity of all the fluids, transudes in such a manner, that the parts near the gall-bladder are often found tinged with yellow in dead bodies: the fæces retained long in the intestina crassa (for dropfical persons are costive) exhale a putrid steam. All these causes concur to make the waters putrefy sooner; which when it once happens, the viscera, perpetually soaked in such a corrupted fluid, consume into a putrid gore: whence it is held a bad sign, if, in tapping, the water come out already putrid, or so as to affect the fingers, and soften the skin, in the same manner as an alkaline lees; of which hereafter.

Ulcers, gangrenes.] When the watery serum stagnates long in the cellular membrane, it not only distends the skin, but, becoming gradually more acrid, inflames and corrodes it. It often happens, that dropfical persons put their feet (cold and swelled) very near the fire, without feeling that the scurfy skin is raised by the heat into blisters, which breaking, ooze out perpetually a considerable quantity of serum. We shall see hereafter, (§. 1242), that such openings are sometimes attempted by art with good success. But as then a free access is afforded to the air, those flaccid parts, which have long been drenched with acrid lymph, suddenly mortify (as we noticed at §. 423.), unless this be prevented by antiseptic fomentations. And often these places, through which the serum is discharged, turn to sores very hard to heal, as the perpetual afflux of acrid serum is a hinderance to the reducing such a sore to the state of a simple wound, (see §. 411) which is necessary to the cure of an ulcer. Whence Hippocrates well remarks, *Ulcers formed in dropfical bodies are not easily cured*<sup>b</sup>. Galen, in his comment on this passage, observes, that the difficulty here proceeds from the moisture, as an ulcer must be dried before it can be brought to a scar. Celsus also confirms this observation: for after he has enumerated the various species of dropfies, he adds, *An excess of moisture however*

<sup>b</sup> Orta hydropicis in corpore ulcera none facil sanantur. *Aphor.* 8. *Method.* 11. *Charter.* Tom. IX. p. 252.



is common to all of them; on which account ulcers are not easily healed in such patients<sup>c</sup>.

A bleeding from the nose.] Only a small quantity of blood indeed flows through the vessels: but if we reflect, that all the lower limbs are pressed upon by the incumbent water; and that in an ascites, when the abdomen is greatly distended, the descending branches of the aorta are also compressed; it is evident, the blood moves freely only through the superior vessels. If now, at the same time, (as has been already said under this aphorism), there is a dyspnœa or difficulty of breathing, the venous blood cannot return from the head: hence dropical persons, cold all over their body, feel a heat sometimes in the head, and have a flushing in the cheeks. Then there follows a bleeding at the nose: which does harm by diminishing the quantity of blood, already too small; and also affords a bad sign, as denoting all the vessels of the lower part of the body to be exceedingly compressed by the dropical swelling. It should seem the prognostic mentioned by Hippocrates, is applicable to this bleeding of the nose in a dropsy: *In chronical diseases, small fluxes of blood are a fatal symptom*<sup>d</sup>; for but a little blood then flows through the vessels, as violent hæmorrhages from the nose are not to be expected. Perhaps also another passage of Hippocrates has a reference to this case: *The belly is costive, and, when forced to give stools, voids small black excrements, like goat's dung; in these circumstances, the nose bleeding is a bad sign*<sup>e</sup>. For dropical persons are costive, as we observed before; when also we quoted that text of Hippocrates, where he used the same word (*στυγεράσματα*) to express the form of the excrements.

Umbilical ruptures.] It is known, that the *linea alba*, as it is called, of the abdomen, is pierced about  
the

<sup>c</sup> Communis tamen omnium est humoris nimia abundantia; ob quam ne ulcera quidem in his ægris facile sanescunt. *Lib. iii. cap. 21. p. 161.*

<sup>d</sup> In morbis longis parvæ apparentes sanguinis fluxiones, perniciosæ sunt. *Coac. Prænot. n° 340. Charier. Tom. VIII. p. 871;*

<sup>e</sup> Alvi interceptæ, sed parvæ, nigra, caprinis stercoreibus similia, ex necessitate deficientes, natus in his sanguinem fundens malum. *Prædict. lib. i. ibid. p. 723. Coac. Prænot. n° 603. ibid. p. 883.*



the middle of its length with a round hole, through which passes the umbilical chord in the fœtus, and is then wider; but is less wide in grown persons. As this place is less firm than the rest of the surface of the abdomen, umbilical ruptures frequently happen: it is not therefore strange, that when the abdomen is full of water, this part should be over-stretched, and thereby occasion a rupture. When a thick and firm fat covers the abdomen, ruptures are less easily produced: and surgeons have observed, that if ruptured persons, who were thin before, begin to grow fat, they are more easily cured. As the old physicians had observed, that, when the dropical parts were distended with water, the others were emaciated; hence they said, as was noted at §. 1225. that the fat liquefied and turned to water. Now Hippocrates tells us, that a dropsy is curable, as long as there is any fat in the lower belly: *But whether there be any fat in the lower belly or not, you may know principally by the following rule; If fevers come on, and the patient cannot bear an erect posture, and the navel be inflated and bunch out, you may pronounce, that there is no longer any fat, and that he is incurable<sup>f</sup>.* From which passage it appears at least, that he thought, when all the fat was wasted, the navel would be more likely to be protruded. But it does not seem right always to esteem this a sign that the dropsy is incurable; as observations shew, that when the navel has not only been protuberant, but when an actual rupture has ensued in that region from the violent pressure of the water, the patients have survived. Du Verney junior<sup>g</sup> saw this event in a woman who, in the flower of her age, after a suppression of the lochia, laboured under an ascites, together with a considerable swelling of the thighs and legs. After many things had been tried without success, the operation of tapping was performed, greatly to the relief

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of

<sup>f</sup> Sed an pinguedo in imo ventre adsit, nec ne, his potissimum diagnoscet; si sane febres advenerint, et erectus stare nequeat, et umbilicus inflatus promineat, pinguedinem non amplius inesse dicito, eumque sanari non posse. *De Intern. Affect. cap. 23. Charter. Tom. VII. p. 655.*

<sup>g</sup> Acad. des Sciences, l'an 1702. Mem. p. 285, et seq.

of the patient; and afterwards the urine, which had before been discharged in very small quantities, was copious; so that all the dropfical swelling disappeared: at the same time the appetite and sleep were good, and the strength soon returned; so that she was thought to be entirely cured, although a purulent matter had been drawn out, together with the water. But, in some weeks after, the abdomen swelled again; and when the patient thought of being tapped again, the navel began to swell, and was opened. A like fluid issued forth as had been drawn out by tapping: a week after, the navel was opened again, and perfectly clear water came away. This happened to her twice more afterwards, the navel spontaneously closed, and she recovered perfect health.

Another case is described by Chomel<sup>h</sup>, in which also, after delivery, on the lochia being suppressed, the abdomen swelled; and although the navel burst, and a vast quantity of fetid humour issued therefrom, the patient survived, and recovered perfect health. An ascites also, which had lasted many years, was cured by the water issuing from the navel, in a woman some years above forty. After very strong hydragogue purges and diuretics administered by the physician, the size of the abdomen rather increased than diminished; and as she would not bear to be tapped, she was abandoned by her physician. After a violent purge, she felt the water come out by the navel, but gradually, and without any inconvenience, except that her linen was perpetually wet. This oozing out of the water lasted the whole winter: and the swelling of the abdomen did not indeed increase; but she grew thin, and lost her strength. In the month of May the next year, as she was riding in a coach, the water burst from the navel with great violence, and in a large quantity, which was followed by great faintness: but although there ensued also a fever, attended with vomitings, hickups, and an asthma, yet she recovered; her colour, plumpness, and strength returned; and she lived in perfect health for

some

<sup>h</sup> Ibid. l'an 128. Mem. p. 583, et seq.



Some months; when being seized with another disease, which was a cholic, with an obstinate costiveness and violent vomiting, she died in a few days. The abdomen being opened, no water was found, nor any thing preternatural in the bowels, except that the uterus was found entirely schirrhous, and was of so large a size as to weigh four pounds and an half.

Such instances seem to shew, that such salutary efforts of nature first suggested evacuation of the water by the operation of the paracentesis.

A sphacelus of the viscera, &c.] That is, when the viscera are soaked in the water, already grown putrid, and dissolved into a rotten pulp.

But the chief things which are of consequence in forming the prognosis of this disease, are thus expressed in Hippocrates. *When a person has a dropsy, in order to afford hopes of his recovery, the viscera must be unimpaired, that nature may exert herself. His digestion must be good, and his breathing easy. He must be without pain; and have his whole body equally warm all over, and not quite wasted away about the extremities. It is rather better that the extremities should be swelled than wasted away: but for neither of these to be the case is best; for it is desirable to have the extremities soft and slender, and the belly soft to the touch. There should be no cough, nor thirst; nor ought the tongue to be dry at any time, especially after sleep, when these complaints are most usual. His appetite should be good, and he should not be oppressed by eating a proper quantity. He should be easily purged by physic, and the excrement by natural stools should be soft and figured. The appearance of urine should answer to his manner of living and the kinds of wine he drinks. He should be able to bear exercise, and not be soon tired. It is best of all when a man has all these circumstances attending his case, and he may then entertain the higher hopes of health. The next thing is to have a number of them, or some of them; and then there will be hope of his escaping: But his case, who has none of these favourable circumstances, is desperate. He in whom a few of these symptoms concur, which I have*



*said were good signs in a dropsy, may have some small hopes<sup>k</sup>.*

It appears from this passage, that he thought the disease so much the more dangerous, as the greater number of the functions of health were impaired thereby; as Galen well observes, as a general axiom, in the passage quoted formerly at §. 3. “The greatness of every disease is in proportion to the alteration it produces from the natural state; but how great that alteration is, he only can tell, who knows accurately what the natural state is.”

§. 1231. **T**HE cure of a dropsy therefore requires, 1. To procure a due fluidity and motion to the lymph, whether it be water, or bilious, ichorous, or bloody serum. 2. To draw out the water already extravasated and collected in the cavities. 3. To repair the injury done to the viscera, whether it be the cause or the effect of the dropsy.

After mention has been made of those things which regard the diagnosis and prognosis in a dropsy, it follows to treat of the cure. And first we are to speak of the general curatory indications. Afterwards we shall

<sup>k</sup> Eum qui hydrope correptus est, et superstes est futurus, bonis visceribus præditum esse oportet, ita ut natura se exferat; simulque facile concoquat, et bene spiret; sitque sine dolore, et totum corpus æqualiter tepidum habeat, et non circa extremas partes colliquatum. Melius est autem, ut tumores potius habeat in extremis partibus: optimum vero est neutrum horum habere; nam molles et graciles esse convenit extremas partes, itemque ventrem ad contactum mollem. Tussim vero adesse non oportet, neque linguam resiccari, tum reliquo tempore, tum post somnos, quando hæc valde fieri solent. At cibos libenter accipere oportet, et ubi idoneam copiam comedet non affigi. Alvum vero ad medicamenta quidem celerem habere, reliquo autem tempore egerere excrementum molle figuratum. Urinam apparere convenit secundum institutum (morem) et vinorum mutationes. Laborem vero oportet ferre facile, et lassitudinis exsortem esse. Ac optimum quidem est hominem per omnia sic dispositum esse, et sic securissime sanus fieri poterit. Sin minus, plurima ex his habeat; nam spes erit ut superstes evadat. Qui vero nihil horum habuerit, sed contraria, eum desperatum esse scito. Qui autem pauca horum habuerit quæ bona esse dixi, si hydrope laboranti adsint, huic exiguæ spes restant. *Predict. lib. ii. cap. 5. Charter. Tom. VIII.*

shall see by what method, and by what remedies, these indications are to be answered.

1. The lymph then has its due flow, when it is of proper texture for circulation, and is propelled through unobstructed vessels with a due impetus. Where all these points are obtained, this first indication is fully answered. But inasmuch (as has been frequently said already) as the subtle lymph, which perpetually is exhaled in the form of a fine steam into the smaller and larger cavities of the body, unless it be reformed by the veins, collects in these cavities, and causes a dropsy; hence, to prevent this, the mouths of the veins must be open, and no obstruction must exist through the whole venous system to impede the return of the reformed lymph from the cavities of the body. Now it was demonstrated before, that a sudden dropsy might arise merely from the compression of the veins; and at the same time we noted, that asthmatical persons frequently became dropical, because, the lungs being contracted in the paroxysm of the asthma, the right ventricle of the heart could not freely propel the blood into them; and therefore the receptacle of the venous blood, *viz.* the right ventricle, remains full, and thus an obstacle is formed to the free motion of the venous fluids. Besides, it appears abundantly probable, that in time of health the arteries exhale a steam, which is reformed by the veins before it can be condensed to lymph: whence such a degree of heat is required in the body, that this condensation may not soon or easily be effected. Such a vapour exhales from the abdomen, thorax, and pericardium, of a healthy animal opened speedily while living, which after death condenses into lymph as the body grows cold.

But although this vapour, and the lymph formed from it, when condensed, consists for the most part of water; yet this is not pure water, as the urinous smell of this vapour shews. Besides, there is often mixed with this lymph, collected in the cavities of the body, a quantity of serum, which coagulates when put over fire. Whence the water of dropical persons

is often tinged with the yellow colour of serum; which colour is sometimes deeper in an ascites, on account of the bile transfusing, as was said before. These waters also may, by long stagnation and a putrefaction beginning, be turned to a sharp ichor; but then little hope remains. However, the word *ichor*, in the writings of Hippocrates and the ancient physicians, did not always signify a sharp putrid humour: for the vapour perpetually exhaling in the cavities of the body was called *πνευμα*; but when this vapour was condensed into a liquid, it was called *ιχρ*.

It sometimes happens, that the waters of dropical persons are tinged with a reddish colour, approaching to that of the blood, when the blood-vessels, long soaked and corroded, let out their contained fluid: But this is also sometimes observed although all the vessels are still entire, especially in the pericardium; where, on account of the nearness of the heart and the great blood-vessels, the circulation of the blood is the most rapid: for there is often found in the bodies of healthy men, dying a violent death, some quantity of reddish lymph. It should seem, that by the rapid motion of the fluids through the vessels in this part, some portion of the red globules is forced through the dilated orifices of the exhaling arteries; and anatomical injections shew, that red wax itself is pressed out all over the surface of the heart, although the vessels remain entire.

But concerning the different colours and various qualities of the waters collected in the cavities of the body, and the prognostics to be drawn therefrom, mention was made at §. 1219. and will be further considered at §. 1240. when we come to speak of the operation of the paracentesis in an ascites.

2. Unless this can speedily be performed, there is always room to fear lest the waters, either increasing in quantity, should injure the bowels by their weight and pressure; or becoming acrid by delay, should corrupt them. This drawing off of the waters from the cavities is to be obtained, either by enabling the veins to resorb the collected lymph, which being again mixed



and with the blood may be discharged by various passages from the body; or, if this cannot be effected, some issue must be found by art, by piercing the place in which the collected water stagnates. Art is of great use to answer this indication, but far greater difficulty attends the next.

3. It appeared from what was remarked at §. 1229, when the causes of a dropsy were enumerated, how many there are among them which cannot be removed at all, or not but with the greatest difficulty by art. In the preceding aphorism, mention was made of the most pernicious effects which are to be feared from a dropsy, and which remain even after the dropsy is removed, and which it is not always in the power of art to correct, or to remove. If the viscera are almost corrupted, or, by having been long soaked in the water, are corroded by the fluid become acrid, who shall promise a cure? Whence the dropsy is deservedly accounted among those diseases which are difficult to be cured. I have known chemists, puffed up with their arcana, who boldly promised a certain cure of the dropsy; but I have at the same time often been a witness how shamefully they have failed. Van Helmont boasts, "that he had restored to health above two thousand dropfical persons, and even some whose water had first been bloody and changed from thence to black, and who had scarce made a spoonful of urine in a whole night<sup>a</sup>."

He did not, however, prolong his life to a great age, as he died at 56 years old: and I believe there are few physicians, who are lovers of truth, who would dare to make the same boast. It is true indeed, if we may believe Helmont himself, that at 17 years old he excelled other physicians. He was born 1588, and gives the following testimony of himself: "In the autumn of the year 1605, on my return from England to Antwerp, I found many hundred persons become dropfical, after a malignant epidemic fever: I cured many, and many perished under the unsuccessful practice of other physicians."

<sup>a</sup> In capitulo, *Ignotus hydrops*, sect. xi. p. 409.

“ ficians <sup>b</sup>. Is not the proverb applicable here, *Oportet mendacem esse memorem*, “ Liars should have good memories.”

Certainly the wise ancients thought far differently of this disease: “ The dropsy is a disease of a disgusting appearance, and troublesome to be borne. “ Very few persons recover from it, and that but from some great good fortune and assistance, rather from the gods than from art, (for the gods alone cure all extreme disorders): for either the disease, occupying at first some particular viscus, vitiates in time the whole habit; or this evil attacking the whole body, at last corrupts and wastes the viscera. “ Sometimes both causes lend each other mutual aid to effect the patient’s destruction; and no part remains untainted with the disorder, or retaining power to assist nature against her enemy <sup>c</sup>.” On this account Aretæus wondered that dropscal persons were fond of life; “ For this no cause can be assigned but we can only wonder at it. For in other diseases, and those not mortal, patients are low-spirited and sad, wishing for death; in dropscal cases, they flatter themselves they shall recover, and desire life. “ such contrary effects do different diseases produce <sup>d</sup>.”

§. 1232. **T**HE due degree of fluidity is procured to the lymph, by removing the impeding causes; which are, 1. The vital strength urging on the circulation too feebly. 2. The compression, rupture, or obstruction of the vessels. 3. The too great viscosity of the fluid itself.

The free flow of the lymph is hindered, either by the fault of the vessels through which it circulates, or from the too great viscosity of the fluid itself; or, though both the containing vessels and the contained fluid are in

<sup>b</sup> Ibid. p. 408.

<sup>c</sup> Aretæus de Causis et Signis Morbor. Diuturnor, lib. ii. cap. i. p. 48.

<sup>d</sup> Ibid. p. 50.

a good state, there may be a defect of force in the moving causes.

1. That our fluids may be moved with a proper force through the vessels, not only the due action of the heart is required, but of the vessels also; for if these are weak, the food will not be assimilated to the animal-fluids, but follow its own natural tendency (see §. 10.), and a cachexy will be brought on, which often is the forerunner of a dropsy, as has been said before. Now as the motion of the fluids depends on the strength of the vessels, hence we noted before, §. 26. that from the weakness of the solid fibres followed too easy a distension of the vessels, as also ruptures, tumours, &c. which all prepare the way for a dropsy. Whence also, at §. 44. a dropsy was enumerated among the effects of weak and relaxed viscera. Now it was shewn, at §. 69. that a glutinous tenacity of the fluids arose from the same causes, by which the free flow of the lymph likewise is impeded.

2. A compression of the venous vessels may impede the return of the lymph; and a rupture of the larger part of these vessels may, by perpetual dropping of the lymph, fill the cavities of the body. This seems less to be apprehended in the lymphatic arteries, as they are small, and therefore no great discharge of lymph will ensue on their being ruptured; but if the lymphatic arteries should be compressed, the exhalation into the cavities of the body would be hindered, whence dryness would rather follow. Any obstruction in these arteries would produce the same effect; and an obstruction can hardly take place in the lymphatic veins (see §. 119.) unless their cavities should be rendered narrower by the real pressure of some adjacent tumour, or from some similar cause.

3. It has been observed, as was said before, that the watery serum collected in the cavities of the body acquired sometimes such a lentor, that it could not be evacuated at all, or with great difficulty, by tapping. But it seems most probable, that when it began to be collected, it had not that tenacity, but was altered by stagnating long in the cavity. But such a tenacity  
may



may be formed in the circulating fluids, either of hot inflammatory kind, or of a cold glutinous sort which will produce very difficult obstructions of the viscera, and so cause a dropsy; (see also §. 1229.) In order therefore for the radical cure, this tenacity must be removed.

§. 1233. **T**HE first cause is removed by cardiacs, by corroboratives, and stimulating remedies; which, if the thirst be not very urgent, are to be chosen from aromatics, saline, oleous, and warm drugs, in the form of an electuary, mixture, medicated wine, or in beer, or pills, decoction, syrup, and lozenge, which form may be easily varied at choice. §. 1232, n<sup>o</sup> 1.

Frequently the whole body is cold in a dropsy, the vis vitalis languishes, the feeble circulation imparts but a slow motion to the fluids; so that Horace's expressions are applicable:

*Aquosus albo in corpore languor;*

O'er the pale bloated body languor reigns.

Wherefore it is then proper to increase the motion of the humours through the vessels. Now as the heart is the primum mobile of the circulation, the remedies adapted to this end are called *cordials*: these sustain and augment the vital motion, although they do not immediately operate on the heart<sup>a</sup>. It is usual to divide cordials into those which fill the vessels by returning plenty of sound juice; or those which strengthen the solids through which the juices move; or lastly, those which by their pleasant fragrance suddenly recruit the exhausted powers, and hence are supposed to increase the quantity of the animal spirits, or by an acrid stimulus so irritate the fibres subservient to motion, that the sluggish vessels and torpid juices are excited to brisker motion.

But

<sup>a</sup> H. Boerh. Institut. Med. sect. 1095. et seq.

But although care should also be taken for the wholesome diet of dropfical persons, yet properly those cordials belong to this indication, which strengthen and brace the flaccid parts, and accelerate the languid circulation by their stimulating power. In our author's *Materia Medica* under this head, are enumerated such remedies as have these medical properties; and there we find also various formulæ composed of these medicines, from which others may easily be drawn up. For as it is sometimes necessary to keep this indication in view for a long time, it is often convenient frequently to change the forms (persisting still in the same course of remedies), lest a too frequent repetition of the same prescription should create a loathing.

We should, however, be cautious in the use of cordials, that we do not all at once and too suddenly increase the velocity of the circulation. For the dropy advances too fast, and the abdomen swells more and more in an ascites, while the arteries continue to exhale the watery serum, of which the veins resorb but a little, or none at all. If therefore the motion of the fluids be suddenly accelerated, especially when they are too much attenuated, they might all be forced into the dilated cavity of the abdomen, and all the vessels of the body would suddenly collapse, an event which would be of dangerous consequence. Trallian observed this; and says, "Very heating remedies taken in great quantities, and at one dose, rather melt down the whole habit, than evacuate the superfluous humours <sup>b</sup>."

Besides, when the stagnant fluids are suddenly put into motion, a sudden fulness of the vessels may ensue, and the lungs be so oppressed, as to endanger suffocation. Thus we see, when the body is swelled by an anasarca, if the patients attempt to move suddenly, they begin to have such an oppression on the breast, that they can scarce breathe, especially if they try to walk up an ascent. For this reason, physicians endeavour to set the stagnant fluids into motion, not

all at once, but gradually, that the extravasated serum absorbed and mixed with the blood, may be expelled by the cutaneous vessels, or by an increased quantity of urine; for unless this end can be obtained, no cure will be effected by increasing the vital motions. For very soon that which had been mixed with the circulating fluid will again be lodged in the cavities.

Hippocrates commends a similar method; for he says, *It is of use to dry such a patient's belly*<sup>c</sup>; and he recommends dry food, of roast flesh particularly. He allowed indeed boiled fish, but such as had been dressed the day before and were grown cold, that they might be as dry as possible; and therefore he ordered that they should have no sauce, and be without salt, that the thirst might not be increased. He gave dark-coloured, thick-bodied, austere wine, but in small quantities; and recommends radishes and smallage among pot-herbs, and advises walking in the morning and after supper. He gives nearly similar directions in another place<sup>d</sup>. But all these things are allowable only if there be no violent thirst; which by these hot remedies would be so much increased, that the patients would not be able to refrain from drinking largely; whence the fluids would have a greater quantity of water added to them than could be exhaled from the body by the acceleration of the vital motion, so that the dropsy would be augmented.

§. 1234. **I**F the thirst be very intense, and the cause arises from heat; or if the disease be attended with a burning fever, which often happens; the thirst requires refreshing cordials, grateful acids, and gentle aromatics.

Thirst is seldom troublesome, till the disease has made some progress, and then is justly reckoned a bad symptom. For thirst, as was said formerly at §. 636. has for its causes either the obstructed circulation of the

<sup>c</sup> Huic ventrem siccare confert. *De Intern. Affect. cap. 33. Charter. Tom. VII. p. 655.*

<sup>d</sup> De Morbis, lib. ii. cap. 28. *ibid.* p. 580.



the humours, or want of moisture, or acrimony, which in an inveterate dropfy is of the putrid kind. When the watery part seceding from the blood is collected in the cavities of the body, the blood, deprived of its diluting vehicle, is rendered too dry and unfit for passing through the vessels; and then thirst arises, which is sometimes very troublesome. Now the dropfy increases, by indulging in drink to assuage this thirst; nor is the thirst removed by drink, because the water received into the body easily separates from the blood, and adds to the quantity of extravasated fluid; nor does it at all diminish the unaptness of the fluids for passing through the vessels; wherefore the cause of thirst still subsists; and in this case those warm stimulants are not to be allowed.

Sometimes dropfies are the consequence of acute diseases, and such dropfies Hippocrates accounted very dangerous. For he says, *All dropfies ensuing on acute diseases are of a bad kind; for they do not put an end to the fever, and are attended with great pain, and prove mortal*<sup>a</sup>. This is principally true, after very bad continual fevers, some species of the scarlet fever, miliary and petechial eruptions; so that the first rise of the dropfy coincides almost with the end of these disorders, and sometimes the patients begin to swell before the heat of the fever is quite over. In such circumstances it would be very unsafe to use warm and stimulating remedies. Whence Trallian has a whole chapter on this very subject, of patients who are afflicted with a dropfy together with a fever, and makes the following remarks: “Wherefore it is not possible, but  
 “that, when an anasarca proceeds from acute diseases, the heat and inflammation attending in these  
 “should persist in the anasarca; for no disease is so  
 “much without intervals as a fever: and strange it  
 “is, that neither the dropfy coming on should extinguish the heat of the patient, nor the fire of the fever dry up the water of the anasarca; but that the

H h 2

“causes

<sup>a</sup> Hydropes ex acutis morbis omnes mali; neque enim febrem solvunt, et cum dolore sunt vehementi et lethales. In *Prognost. Charter. Tom. III. p. 619. et Coac. Prænot. n° 452. ibid. p. 878.*

“ causes fire and water should continue to support  
 “ both diseases, so as to render the cure more ambi-  
 “ guous and hazardous, whether we attempt to ex-  
 “ cite warmth, or to cool the patient <sup>b</sup>.”

But it frequently happens, that, in an inveterate dropfy, the stagnating waters begin to putrefy and to become acrid; and then a hot fever is kindled in the body which was cold before, a prodigious thirst comes on, and all things tend from bad to worse. Thus it is sometimes observed, that the legs and thighs of dropfical persons, which were swelled, pale, and cold as marble, begin to grow red and warm, while at the same time even a slight touch of the skin gives pain. The skin is soon after corroded, and sometimes a great quantity of watery serum oozes from it, with some relief to the patient; but often a very bad and spreading mortification follows. Whence Trallian well advises; “ But if they who have an anasarca are also feverish,  
 “ we must not use very warm remedies, neither for  
 “ the bowels, nor in food or drink, or antidotes, or  
 “ carthartics, &c. for nothing very heating can do  
 “ them good; for such remedies only increase their  
 “ thirst, and add fuel to the flame of the fever, and  
 “ render the evil more intense <sup>c</sup>.”

But seeing, as has been said, that a dropfy (especially that kind called an *anasarca*) sometimes follows acute diseases, it was perhaps for this reason that the old physicians recommended bleeding in this species of dropfy. Thus Ægineta advised to begin the cure of a tympany and ascites by hydragogue purges: but he would prefer bleeding as the first step in an anasarca; “ especially if the disorder took its rise from a  
 “ suppression of the hæmorrhoidal or menstrual dis-  
 “ charge, except the patients have used bleeding be-  
 “ fore for their complaints <sup>d</sup>.” We read like observations in Trallian, where he asserts, that bleeding is sometimes requisite in an anasarca, “ because it arises  
 “ from a superfluity of cold blood; though it does  
 “ not indeed require bleeding on account of the fri-  
 gidi-

<sup>b</sup> Lib. ix. cap. 3. p. 526.

<sup>c</sup> Ibid. p. 525.

<sup>d</sup> Lib. iii. cap. 48. p. 48, versa.

“gidity, but because diminishing the quantity light-  
 “ens nature of a load.” But from another passage  
 it appears, that Trallian hesitated concerning bleed-  
 ing<sup>f</sup>: for he adds several cautions; and allows of  
 bleeding only when there is an inflammation tending  
 to a schirrhus in the viscera, or a great quantity of  
 depraved humours in the veins, if the strength be en-  
 tire, the patient in the vigour of life, and the weather  
 be not very cold. Nay, he seems to prescribe bleed-  
 ing only with a view to the more safely administering  
 very heating remedies, and is very careful to warn us  
 that great caution is necessary; “for unseasonable  
 “bleeding in other diseases is dangerous, in dropfies  
 “it is sometimes fatal.”

It was before observed, that an impeded motion of  
 the venous blood may give rise to a dropfy, and there-  
 fore too great a fulness of the vessels may have this  
 tendency also. In such a case, lessening this fulness  
 by bleeding would undoubtedly be of service. An in-  
 stance to this purpose is related by Hildanus<sup>g</sup>, of a  
 very robust man of a sanguine constitution, in his  
 thirtieth year, who was swelled from head to foot.  
 While the physicians were attempting the cure by a-  
 perients and gentle purges, the blood suddenly gush-  
 ed from his right nostril, to the quantity of four  
 pints: a syncope followed this violent hæmorrhage.  
 When the hæmorrhage was stopt, not only his strength  
 returned; but he was also soon cured of the dropfy,  
 without the use of any other remedies. Hence we  
 plainly see under what circumstances bleeding may be  
 allowable in a dropfy: for most commonly the loss of  
 blood is hurtful to dropfical persons; nay, a profuse  
 discharge of it even in robust and healthy men, some-  
 times brings on a dropfy, as was observed at §. 1229.  
 When therefore the disease arises from a hot cause,  
 or a hot fever comes on and attacks a dropfical person,  
 or vehement thirst torments the patient, those warm  
 stimulating remedies mentioned in the preceding ap-  
 phorism are not advisable. Wherefore in the *Materia*

H h 3

Me-

<sup>c</sup> Lib. ix. cap. 3. p. 514.  
 Centur. I. p. 43.

<sup>f</sup> Ibid. p. 518.

<sup>g</sup> Observat.



Medica, under this head, other kinds of remedies are prescribed; as crystals of tartar, rob of elder, rob of juniper, spirit of sea-salt, &c. which both appease the thirst, and most efficaciously counteract the putrefaction apprehended in this case. Aromatic remedies are likewise here recommended, but of the milder kinds; and the quantity a skilful physician will easily determine, according to the degree of langour, heat and thirst, under which the patient labours.

§. 1235. **I**N either case, (§. 1233, 1234.) friction, motion, and heat, are of use.

The whole intention of these is so to increase the vital powers, that the stagnant lymph may be put into motion, reabsorbed by the veins, and discharged by various channels from the body. But how serviceable frictions are for increasing the motion through the vessels, was shewn at §. 28, no 2. And besides it appeared at §. 334. when we treated of the cure of a bruise, of how great efficacy friction, prudently managed, was for dissolving extravasated and grumous blood; therefore its effects will be still greater on serum beginning to lose its fluidity. But frictions are above all efficacious in an anasarca, wherein the collected water stagnates in the adipose membrane: for although they may have their use in other kinds of dropsies, yet they act more immediately on the extravasated serum, when the skin only intervenes, than if the abdomen was to be strongly rubbed in an ascites. Whence Trallian says, “Friction should be used in dropsies, principally to open the pores, and to attenuate and dissolve the humours<sup>a</sup>.” Aëtius<sup>b</sup>, and many other writers, highly commend friction for the cure of an anasarca. But these frictions were administered in various manners: “The first day therefore we should use friction with a little oil, moderately and gently; afterwards dry, hard, and close friction; and at last, the patient may be rubbed with coarse, rough, linen cloths.”

Cer-

<sup>a</sup> Lib. ix. cap. 3. p. 524.

<sup>b</sup> Serm. x. cap. 28. p. 244.

Certainly, when the skin is rubbed by the hand smeared with oil, it is less hurt and irritated, and the patients endure rubbing longer without pain. It is indeed true, that a part rubbed with oil is rendered less perspirable: but as the intention is only to set the stagnating fluids in motion, and to alleviate those which are sluggish and viscid, increasing at the same time the motion of the fluids through the vessels, it seems safe enough to use oil; and the old physicians used it, and medicated it by adding squills and other drugs<sup>c</sup>. Simple oil of olives has been known to have an equally salutary effect, even in an ascites, which was cured by friction therewith, used night and morning for a month; and on the third or fourth day after it began to be used, the urine became copious, and the swelling of the abdomen decreased every day afterwards<sup>d</sup>. Now the success in this case seems due to friction, and not to any peculiar virtues in oil of olives. Stools were procured, by this means, without purges. But friction with oil is not adviseable, if the swelling of the belly be very great, and the integuments be thin and stretched tight, and the breathing very laborious<sup>e</sup>; but when the swelling begins to decrease, the skin, being less stretched, is able to bear stronger and rougher friction.

There was another method, of a like effect with friction, in use among the ancients, which is scarce ever practised now, and yet seems safe and useful enough. Of this method Aëtius thus speaks: “It is also advisable to try the remedies of Herodotus; for it is not less useful than friction: taking therefore bladders of oxen, or other large bladders, blown up to their full extent with air, beat the swelling places with them. This both *Archigenes* and *Herodotus* advise; for by this method the flesh is rendered more firm and compact, without pain or bruise<sup>f</sup>.”

By all these methods they hoped to obtain the end  
of

<sup>c</sup> Ibid.

<sup>d</sup> Donald Monro on the dropsy, p. 30, 31. Nouvelle Bibliothèque Angloise pour les mois de Janvier et de Février, 1757. p. 107.

<sup>e</sup> Storck Ann. Med. T. 20.

<sup>f</sup> Serm. x. cap. 23. p. 246.

of setting in motion the stagnant fluids, and in consequence dissipating the dropfical tumour, and at the same time avoided hurting the skin. I have often seen, that, the legs being rubbed without due caution, the skin has inflamed and mortified, often dangerously, and always to the great suffering of the patient. Hence Celsus, treating of the cure of a dropfy, very prudently advises thus: *Friction must be used, the hands being only moistened with water mixed with salt and nitre, and a little oil; and that by the hands either of a child or a woman, as their touch is softer: and if the strength will allow, it may be continued a whole hour in the forenoon; in the afternoon half an hour*<sup>g</sup>.

We see also, that the ancient physicians very prudently began with gentle frictions, lest the extravasated serum, being all at once remixed with the blood, should oppress the lungs, and put the patient in danger of suffocation. Hoffman<sup>b</sup> has observed, that an œdema of the feet, repelled into the habit by any cause, produced a great oppression and straitness on the breast. Nay, he saw in some such patients, who were taken with an ague, that as the cold fit began, the swelling in the feet disappeared, a prodigious difficulty of breathing followed, and sudden suffocation always ensued in the third fit, as soon as the shivering began.

Motion.] Mention was made before, at §. 28. of the excellent effects of motion for the recovery of health. Certainly by exercise the motion of the venous blood towards the heart is accelerated, and the circulation of the fluids may be quickened at will: whence in all times exercise and motion were reckoned among the remedies of dropfies. Hippocrates enumerates, as the chief remedies for a dropfy, “labours, fomentations, and temperance<sup>i</sup>,” and for labours his

<sup>g</sup> Utendum frictione, madefactis tantum manibus aqua, cui sal et nitrum et olei paucum sit adjectum, sicut aut pueriles aut muliebres manus adhibeantur, quo mollior earum tactus sit. Idque, si vires patiantur, ante meridiem tota hora, post meridiem semihora, fieri oportet. *Lib. iii. cap. 21. p. 164.*

<sup>b</sup> Medic. Ration. et System. Tom. IV. part. 3. cap. 2. p. 324.

<sup>i</sup> De Visu Acutor. Charter. Tom. XI. p. 174. Epidem. v. Charter. Tom. II. p. 347.



is word is *ταλαιπωρίας*, which indicates hard and fatiguing labour: and he adds, that the patient ought to labour very much, and even to walk up steep places. But lest the lungs should be oppressed by violent and sudden motion, he gives this caution: *But if he have difficulty of breathing, and it be summer time, and the man be in the prime of his age, and his strength be good, food should be taken from the arm<sup>k</sup>.*

The muscles swelling when they act, the cellular membrane is thereby pressed, as it not only lies upon the muscles, but is even interposed between their fibres; wherefore exercise may be useful in an anasarca upon this account, by moving the stagnating serum. Hence Celsus advised much walking sometimes; and on this account thought, that *it is more easily cured in slaves than in free persons; because, as it requires fasting, enduring of thirst, and a thousand other hardships, such are more readily relieved who are readily commanded, than they are who enjoy a hurtful liberty<sup>l</sup>.*

But as the circulation of the fluids is accelerated by strong exercise, it is easy to see that this is not proper if the circulation be already too impetuous from the concomitant fever; whence this author adds: *But if it be attended with a fever, that in the first place should be removed by such means as have been prescribed for the cure of that disease. When the patient is free from a fever, then we may apply the usual remedies of the dropsy<sup>m</sup>.*

We readily see that the same caution is to be observed here, that the stagnating fluids should not be too suddenly set in motion by violent exercise. But we should begin by gentler motion, which is better suited to the strength of such patients, who are sometimes rather

<sup>k</sup> Si vero difficulter spiraverit, fueritque æstiva anni tempestas, ætas iugetur, et virium robur adsit, sanguinem e brachio detrahare oportet. *Ibid.*

<sup>l</sup> Facilius in servis quam in liberis tollitur; quia, cum desideret famem, sitim, et mille alia tædia, longamque patientiam, promptius iis succurritur, qui facile coguntur, quam quibus inutilis libertas est. *Lib. iii. cap. 21. p. 161, 162.*

<sup>m</sup> Sed si febris quoque est, hæc imprimis submovenda est per eas rationes per quas huic succurri propositum est. Si sine febre æger est, tumenum ad ea veniendum est, quæ ipsi morbo mederi solent. *Ibid.*

ther feeble, while at the same time the weight of the lower limbs in an anasarca renders motion difficult. Whence Trallian said, " Motion certainly is of as much service as any thing to dropfical persons, especially in a ship, on horseback, or in a litter; but where the strength will allow, walking is most serviceable." Sailing on the sea is of service even to the weak, and its usefulness is confirmed by modern observations. Thus we read in Forestus<sup>o</sup>, that a dropfical man given over by his physicians, and who was swelled not only in the belly, but in hands, feet, and face, sailed some miles out to sea: he vomited; and using exercise after the vomiting, he recovered. It is well known, that they who are unaccustomed to the sea are subject to a grievous sickness and vomiting in sailing upon it. Now we shall see hereafter, (§. 1244.) that vomits are of great use in curing the dropfy. The use of sailing on the sea is confirmed by many observations<sup>p</sup>.

Heat.] It has been already observed, that in health the fluid exhaling into the cavities of the body is expelled from the arteries in the form of a steam, and reformed by the veins before it has condensed to a watery fluid. Whence we see, that physicians have always endeavoured to warm the cold bodies of dropfical persons, in order to move the stagnant serum, and dispose it to rarefy into a vapour, to be afterwards imbibed by the absorbent veins. By friction and motion the warmth of the body is augmented: but besides this the ancients applied external heat, and that to a very considerable degree. Aëtius says, " I expect great benefit in a dropfy from the warmth of the sun: therefore let the swelled parts be exposed to the sun; but cover the head, and take care that the swelling be not heated to excess<sup>q</sup>."

He advised that the frictions themselves should be used either in the sun or at the fire: " Sometimes it is advisable to cover the patient with sand, well heated

<sup>o</sup> Lib. ix. cap. 3. p. 524.

<sup>o</sup> Lib. xix. obs. 32. p. 377.

<sup>p</sup> Ebenezer Gilchrist on the use of sea voyages, p. 88.

<sup>q</sup> Serm.

cap. 28. p. 244, 245.

heated by the sun, or with hides also warmed thereby, covering only his head, and constantly wiping the face with a sponge." Celsus advises similar methods: *A sweat is also to be procured, not by exercise on-ly, but also by hot sand, or the laconicum (a kind of stove), or a dry bath, and such like means, &c. The water bath and all moisture is hurtful*<sup>r</sup>. Dry warmth is required here; but after the waters have been drawn off by tapping, to prevent a relapse, *the patient must return gradually to exercise, frictions, exposure to the sun, sweats, &c. and proper diet, till he is quite well*<sup>r</sup>.

1236. **T**O answer the second intention of §. 1232, we must find out the cause which straitens, obstructs, or ruptures the vessels, which, if possible, is to be removed, §. 1229. or often corrected by the use of mineral waters.

We treated of the causes of a dropsy at §. 1229.; and it was then also shewn, that many of them could not at all, or but with great difficulty, be removed. If, for instance, a large steatomatous tumour in the abdomen compresses the neighbouring veins, who will dare to promise a cure, when such tumours even in the external parts can scarce ever be removed but by the hand of the surgeon? On the other hand, when the swelling womb of a pregnant woman presses on the iliac veins or the descending branch of the vena cava, the thighs and legs frequently swell prodigiously; but after delivery, when the womb contracts itself again, the pressure on the veins is removed, and an anasarca from this cause soon ceases spontaneously, or at least is easily overcome by gentle friction alone.

This seems to be the reason why a dropsy is sometimes

<sup>r</sup> Evocandus est sudor, non per exercitationem tantum, sed etiam in arena calida, vel laconico, vel clibano, similibusque aliis, &c. Balneumque omnis humor alienus est. *Lib. iii. cap. 21. p. 162.*

<sup>s</sup> Paulatim revocandus est æger ad exercitationes, fricationes, solem, sudationes, fatigationes, et idoneos cibos, donec ex-toto convalescat *ibid. p. 166.*



times cured by the use of mineral waters; that is when the obstacles which impede the free motion of the lymph are removeable by these waters.

Abstinence from drink, as we shall see hereafter, is reckoned among the most efficacious means for the cure of a dropfy; so that it may be hurtful for such waters to be drank plentifully: but it is to be observed, that these waters are only of use when the vis vitalis is entire, so as to be capable of circulating these waters through the habit, and discharging them by urine, sweat, or stool; for if they remain in the body, they increase the dropfy. Wherefore prudent physicians begin to make trial of them by a small quantity; which they augment afterwards, if they find them agree with the patient, and that the discharge by urine answers to the quantity of liquor drank. For these salutary waters have a sort of spirit or stimulus perceivable by the palate, which soon flies if they be left in the open air; by means of which stimulus they are soon imbibed by the absorbent veins of the stomach and intestines, and easily moved along with the circulating fluids thro' the vessels. Certainly, if a healthy man was to drink four pints of common water every morning, in a short space of time he would find himself greatly incommoded; whereas a valetudinarian will drink a larger quantity of spa water without any inconvenience.

Many instances are related by authors who have written of the powers and uses of medicinal waters, which shew that the dropfy is sometimes cured by them. Cocchi<sup>a</sup> who collected many cases, confirmed this; and similar instances are to be found in other authors.

For as dropfical persons generally make very little water, if by drinking these waters the quantity of urine should suddenly be much augmented, sometimes these passages are so happily opened, that an entire cure ensues, and even in a dropfy thought desperate before. A wonderful case of this kind (which Cocchi

<sup>a</sup> De i Bagni de Pisa, p. 265, &c. in notis.

ni also mentions) is circumstantially related <sup>b</sup> of a man, who from high living was taken with the jaundice, and afterwards swelled with an ascites. Several eminent physicians tried various remedies without effect. When no hope remained, he was carried to the mineral waters, and besought his wife to allow him this only consolation before his death, to quench his insupportable thirst by drinking as much of these waters as he chose: having obtained this leave, he drank a prodigious quantity of the waters in the space of five or six hours, without making a drop of water. A cold, clammy, sweat, and extreme faintness, ensuing, made the bystanders put him into bed again, as they thought dead; but in half an hour, the urine began to flow in such a quantity, that he discharged all half the quantity of the water he had drank. This done, he recovered his speech, and asked for a little strong wine; which having drank hot, he fell into a deep sleep, and all night he sweated, and the urine fell constantly from him by drops; and at the same time thin watery stools came from him, and he recovered. The physician who had attended him, and had given him over, was amazed at meeting, two years after, this man in good health, whom he thought to have been long in his grave. A dropfy following a jaundice is reckoned by physicians of a very bad kind, so that this cure was the more wonderful.

Something similar seems to have been observed by Hippocrates: for where he treats of a universal dropfy, arising from drinking largely of stagnant rain-water, he recommends strong purges for the cure; and then adds, *But above all, give a great deal of that kind of water which occasioned the disease, that it may loosen the belly, and he may have many stools* <sup>c</sup>: for although no mention is here made of medicinal waters, yet it appears that he attempted to expel by copious draughts of water, the water collected in the body.

<sup>b</sup> Floyer ψυχρολουσία, p. 457.

<sup>c</sup> Potissimum vero ejus aquæ ex qua morbus corripuit, quam plurimum propinato quo ejus ventrem turbet et multum deiciat. *De Intern. Affect. cap. 28. Charter. Tom. VII. p. 658.*

§. 1237. **T**HE too great viscosity of the fluids, both in a hot and cold dropfy, may be resolved, 1. By the remedies prescribed in §. 1233, 1234. 2. By alkaline salts, both volatile and fixed, but more especially by the latter. 3. By mercurials, antimonials, and venereal remedies, well prepared by the art of chemistry, and judiciously applied by the physician.

It is indeed true, that the humours are sometimes found too much attenuated in a dropfy, and then such remedies as have a power of attenuating the humours are not needed. But by what was said in the chapter of a Spontaneous Gluten, we may see what are the diagnostics of this vitiation of humours: at the same time we may understand, from the enumeration of the causes of a dropfy, what we are to conclude as to too great a viscosity of the fluids. For if after copious hæmorrhages, and after drinking great quantities of water, a dropfy suddenly arises, without the signs that attend obstructed viscera, or a viscid cacochymy, attenuants are not indicated, but we should rather endeavour to carry off the watery colluvies, and then restore the strength by corroborants. It is indeed true, that the watery serum collected in the cavities of the body may grow viscid by stagnation; but remedies are not likely to have any great efficacy on extravasated fluids, especially if they are collected in a great quantity. Nor is every kind of lentor or viscosity a bad sign: for Mons<sup>r</sup>. Du Verney the younger<sup>a</sup>, (who has frequently been mentioned before) has observed, that there are greater hopes of a cure, if the waters drawn out by tapping should prove in some degree mucilaginous; whereas, on the contrary, if they were like rain water, and left no sediment after evaporation, or but very little, the patients generally died.

But those remedies which dissolve viscosity, sometimes

<sup>a</sup> Acad. des Sciences, l'an 1703. Mem. p. 206, 207.



times also are of use by evacuating, as will be seen hereafter, especially if they are given in large doses : but here we are properly to consider the attenuating and dissolving qualities, by which they are adapted to remove obstructions of the viscera, which are so often the cause of dropsies.

1. All the remedies mentioned in the comment to §. 1233, and 1234, are here of service, as they rouse the vital powers, which propel the blood through the vessels. At the same time, it was there noted from what class they are to be taken in the different kinds of dropsy, that is, in the hot and cold. See what was said of the *Gluten Spontaneum* at §. 65, *et seq.*

2. Before, in treating of the cure of obstructions, §. 135. alkaline salts, both fixed and volatile, were enumerated among attenuating and dissolvent remedies ; and these we now use with the greater confidence, as Pringle's experiments <sup>b</sup> demonstrate that putrefaction is not promoted by these salts, as was formerly imagined. Volatile alkaline salts, as the *sal volatile oleosum* of the shops, and such like preparations, were mentioned at §. 1233. as stimulators and increasers of motion ; and they are at the same time justly had in esteem for their dissolvent property. But there are some plants which naturally contain a volatile alkaline salt, like that which chymists extract from various bodies. Onions, garlic, mustard-seed, and several other plants called acrid antiscorbutics, contain plenty of a volatile alkaline salt, which is scarce perceived so long as these plants continue whole ; but when they are cut or bruised, it presently exhales every way, strikes the smelling, and by its irritation draws tears from the eyes, and twinges the tongue. The efficacy of these and the like plants, penetrates the whole body, almost without any alteration. It is known, that the breath, the sweat, and urine of men fond of garlic, have the smell of that plant ; which is also deservedly accounted a diuretic, and useful for that reason also. Forestus <sup>c</sup> mentions his having seen

<sup>b</sup> Observations on the diseases of the army in the appendix.

<sup>c</sup> Lib. xix. obs. 27. Tom. II. p. 369.

obstinate dropfies cured by the use of garlic only. Sydenham declares, “ that he knew of the dropfy being  
 “ cured (by the advice of others, not of himself) by  
 “ garlic, without using evacuating remedies<sup>d</sup>. ”

As these bulbous roots and seeds exhale this volatile substance as soon as they are cut or bruised, it has been a custom among the vulgar to swallow garlic-roots and mustard-seeds whole, that, being softened and macerated in the stomach and intestines, they may gradually exhale the volatile alkaline salt which they contain without any loss. A wonderful effect of remedies of this kind is recorded<sup>e</sup>: A woman fifty years old had an ascites, which was not relieved either by purges or by diuretics; she had been thrice tapped, but swelled again; by the advice of an old woman, she took morning and evening a spoonful of mustard-seeds whole, drinking upon them half a pint of the decoction of the green tops of broom; and in three days she found some relief, her very troublesome thirst being entirely appeased. She made at least five or six pints of water every day, and was sometimes purged for two or three days together by this remedy. She persisted in this method for a year, and the dropfy never returned. It is indeed true, that broom is a plant famous for doing good in a dropfy; but it is very probable, that the mustard-seeds contributed their share to the success in this case. Broom has a salt juice; and the ashes of this plant, or the fixed salt extracted from it in making a ley, afford a remedy of great esteem in this disease. It is usual to infuse ashes of broom, or the salt of it, in wine, and to give  $\mathfrak{z}$ ij of this medicated wine twice or thrice a-day: generally an ounce of the salt is infused in two pints of Rhenish, mosell, or some such acid wine. When the ashes are used, a pound of them answers generally to an ounce of the salt. But the quantity of fixed salt in the ashes of broom is observed to vary according to the diversity of the soil: when this plant grows in sandy-places on the sea-coast, it generally

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<sup>d</sup> De Hydrope, p. 633.  
 p. 138.

<sup>e</sup> Mead monita et præcepta medica,

contains more of the salt than if it grew in a fatter or moister soil. The ashes and salts from bean stalks, wormwood, *carduus benedictus*, and several other plants, are recommended for the same purpose. But when fixed alkaline salts are infused in wine, there is produced a salt compounded of an acid and alkali, and with a saponaceous quality from the oily particles of the wine united to it, very penetrating, and agreeing well with the body, and endued with singular efficacy for dissolving viscidities and removing obstructions. It is well known how deservedly the preparations called by the chemists *tartarus regeneratus*, and *terra foliata tartari*, are commended; which are compounded of the acid of vinegar, and fixed alkaline salt of tartar, intimately united by a complete saturation, in such a manner, that neither the acid nor the alkali predominate. A remedy like these, and possibly still more penetrating, is produced, when spirit of sal ammoniac, which is volatile and alkaline, is united to that sufficiently volatile vegetable acid, the distilled vinegar of the shops: from the mixture and perfect combination of these two, there arises a very mild compound salt, which does not even irritate the eye, (at least not when diluted with a little water), and gives no sort of disturbance to the body; and therefore is very safe to be used, both in acute and in chronic diseases, as a powerful dissolvent; and at the same time greatly promotes the excretions by urine and sweat. If these things be considered, no one will be surpris'd that physicians have such confidence in remedies of this kind for curing the dropsy, and removing the most frequent causes of dropsies, *viz.* obstructions in the viscera.

Sometimes they have successfully combined volatile, fixed, and alkaline salts, with the corroborating power of steel, for the cure of a dropsy. Thus we read, that an ascites, accompanied with an anasarca of the thighs and legs, a difficulty of breathing, a great thirst, together with a quick weak pulse, was cured by drinking every day four ounces of a beer, in twelve pints of



which were steeped a pound of ashes of broom, with two ounces of mustard-seeds, and four ounces of steel filings: and the effect was so sudden, that after the first dose the patient made twenty pints of water; and by continuing to use this drink, and taking physick between whiles, she recovered.

3. It is known, that various remedies are prepared from mercury, antimony, and copper, which most powerfully set the body in motion, and evacuate upwards and downwards. But here we are not treating of that property of these remedies, by which they are wont to expel the water collected in the cavities of the body; but rather of their efficacy in dissolving viscidities, and thereby removing those obstacles in the vessels and viscera which gave rise to the dropsy. For these viscidities being dissolved, there sometimes follow profuse evacuations, especially by sweat and urine; sometimes, but less frequently, by stool; and that greatly to the relief of the patients, their strength increasing instead of sinking by them. For in this case these evacuations are not produced by the stimulating power of the remedies; but, the obstacles being removed or much lessened, nature, who so often is her own physician, expels by various passages the load of water from the body.

Salivation, excited by mercury, dissolves all the humours in such a manner that the whole habit is emaciated; although prudent physicians endeavour to prevent the humours going off by stool, as they are rendered so acrid as to ulcerate all the mouth, and might affect the intestines in the same manner. However, a dropsy was cured by salivation in a man of thirty years old, who had both an ascites and an anasarca; and as the anasarca remained after tapping, and yielded to no remedies, salivation was tried with so good success, that the disorder entirely disappeared, and the man recovered perfect health<sup>s</sup>. I spake on another occasion, (§. 135. 4.) of this wonderful dissolving property of quicksilver, when treating of the Cure of Obstructions.

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Great care is necessary in preparing these metallic remedies, and great judgment in administering them. On this account I used to make the most difficult of them myself, or trust the preparation of them at least to none but those on whose fidelity and chemical skill I could entirely trust. But I did not do this with any view to dispense known remedies under the name of Arcana, or for sordid gain, to conceal any peculiar efficacy which I had discovered of which others were ignorant, for I immediately revealed any thing useful that I knew. I have seen, with great indignation, physicians (unworthy of that name) in books written in their mother tongue, obtrude their wares on the ignorant vulgar at a set price, to satisfy their avarice by these shameful arts. Her Majesty the Empress Queen rewards with honours and wealth those who invent something new and useful in the art; but has prohibited in her dominions those shameful treatises, whereby credulous men might be deceived and injured, always in their pockets, and sometimes in their health. But this by the bye.

But for the present intention these remedies are usually prescribed in such small doses, or so mitigated by various preparations, that they do not at all irritate the stomach and intestines; or so gently, as to excite neither vomits nor stools; although the same remedies in larger doses, or prepared in a different manner, have a violent emetic or cathartic efficacy on the body. Many *formulae* are to be found for this intent in our author's *Materia Medica* under this head, where mercurials are prescribed in a very small dose, and the emetic power of antimony is blunted and rendered exceeding mild. Such seems to have been the *præcipitulum* Paracelsi, of which Van Helmont makes such boast, saying, "It cures all dropsies, not by purges, but by passing in substance through the intestines, and dissolving the extravasated humour. But if it excite vomiting or stools in a dropsy, that is merely accidental<sup>h</sup>." And it appears that he did not approve of the purging quality of this remedy, as

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<sup>h</sup> In capitulo, *Ignotus hydrops*, sect. 39, et seq. p. 416, 417.

is plain from what he says a little after, when he recommends white briony root for a dropsy: "Wherefore briony will be useful as a hydrogogue, if its purging quality be taken off." In the same manner he commends antimony first dissolved into a fluid, and then reduced to a powder, but only as a sudorific; for these are his words: "We have a remedy which gently removes all dropsies, without any danger of a relapse." Concerning Paracelsus's *Præcipiolum* he says, that it is hard to be procured; but that two grains are enough, repeated three or four times. Concerning the preparing of this remedy, he has the following expressions: "That we may obtain our purpose in this preparation, the mercury must be killed, without any combination of external salts, or concomitance of foreign spirits. But it must be so killed as to remain alive in a chariot, which may be able, in this half life of the mercury, to bear it to its destined place. I congratulate him, whom experiments in the fire have taught to understand me!" Now from what was said at §. 135, n<sup>o</sup> 4. it appeared, that mercury, without any thing being added to it, might be converted into a powder of an acrid metal-line taste, by digestion or repeated distillation alone: but the powder produced in this manner from quicksilver, by a strong fire only is almost totally changed again into quicksilver, and loses all its acrid taste. Hence it seems probable enough, that the *Præcipiolum* of Paracelsus was a powder of this kind. I have known it produce effects not to be despised in a dropsy, and in other difficult diseases: I have seen a single grain given alone, with purging physic, cure a very bad ulcer on the tongue; but it excited such a commotion in the body, that the patient was very faint for two days after taking it.

But although this mercurial preparation is not undeservedly commended for its singular efficacy, yet a similar effect has sometimes been observed from other officinal preparations of mercury. Thus an ascites, accompanied by an universal anasarca, was cured by



few doses of mercurius dulcis, which were followed by a copious discharge of urine<sup>k</sup>. A like effect has been observed from emetics given in very small doses, and especially if opium was added to them<sup>l</sup>. Copper dissolved in a volatile alkaline spirit, and given in such a quantity as not to raise any commotion, has sometimes been of signal service<sup>m</sup>.

This useful method of giving violent remedies in so small a dose as to occasion no disturbance, seems to be of great moment in the cure of a dropsy, and in other chronical and difficult diseases; and is not only proper with regard to mineral, but also to vegetable preparations. There are many plants suspected of poisonous qualities; which perhaps, after various preparations, or given in a diminished dose, may be safe and useful. Many of the ancient physicians were afraid of the juice of poppies; Paracelsus, by a bold use of it, got great reputation. The cicuta was quite in disrepute for its deleterious quality; and we owe to the ingenious Dr Storcke, the knowledge that it may be given without injury, even in no inconsiderable quantity; and that it is of great efficacy in the cure of cancers, both internal and external. It seemed indeed scarce probable, that a plant growing almost in all countries, should have been created only for the destruction of mankind. The ancients used hellebore for the cure of very difficult diseases; but in such a quantity, that it did not purge the body without bringing the patient in danger of convulsions, and even of death: for they applied a remedy as terrible as the disease, when they prepared the body by baths and other methods to support the force of such violent drugs. The learned dispute, whether the hellebores of the ancients are known by us. It is certain, that those plants, to which we at this day give the name hellebore, are of great efficacy when fresh, and not grown rotten by having been long kept. It has been observed, that the black hellebore of the shops, given in a moderate dose, has a signal efficacy for the cure

<sup>k</sup> Donald Monro on the dropsy, p. 62.

<sup>l</sup> Ibid. p. 52.

<sup>m</sup> Boerh. Chem. Tom. II. p. 498,

cure of a dropſy<sup>n</sup>. From white and black hellebore and ſometimes from black hellebore alone, Gefner made his *Oxymel Helleboratum*, whoſe excellent properties he deſcribes in a letter to Adolphus Otto: he made uſe of two ſuch oxymels, which he calls the *Majus* and *Minus*, greater and leſs; and he ſays that he gave a very ſmall doſe of the oxymel minus in Cretan wine (repeating the doſe five or ſix times) to his own mother, when ſhe was much advanced in years, and dangerously ill of an aſthma, with ſuch ſucceſs, that ſhe grew better preſently, and ſeemed returned from death to life. And he has publiſhed a little treatiſe, in which he diſcourſes of aconite, and at the ſame time deſcribes his two oxymels<sup>p</sup>. He ſays of it, “ It gave relief to dropſical and cachectic perſons, “ the aſthma and thirſt decreaſing preſently<sup>q</sup>.” It is true, indeed, that he combined many other remedies with this compoſition, as was the cuſtom of phyſicians in the ſixteenth century: however, he ſeems to aſcribe the chief efficacy of theſe preparations to the white hellebore. For he ſays, “ Nor need any miſchief be feared from white hellebore, when taken “ ſo moderately and in ſo ſmall a doſe; and I myſelf “ uſe it in ſuch a manner with good ſucceſs for my “ own patients<sup>r</sup>.” How happy would it be for mankind, if phyſicians would follow the ſteps of ſuch great men, and try with caution what ſmall doſes of efficacious remedies, which in large doſes are reckoned hurtful, are capable of doing!

§. 1238. **T**HE waters collected in the cavities are drawn from thence, 1. By tapping. 2. By making new out-lets for their diſcharge. 3. By urine. 4. By vomiting. 5. By purging. 6. By diſperſion.

Three general indications in the cure of a dropſy were

<sup>n</sup> Friend's hiſtory of Phyſic, Part II. p. 105.

<sup>o</sup> Epit. Med.

Conrad. Gefner, p. 48. verſa et 49.

<sup>p</sup> Conrad Gefner de aconit.

et oxymelle hellebor. &c. p. 21.

<sup>q</sup> Ibid. p. 26.

<sup>r</sup> Ibid.

p. 27, verſa.

were enumerated, §. 1231. Hitherto we have treated of the first; which is, The procuring an unobstructed passage to the lymph: The second indication follows next; which is, To draw off the waters from the cavities where they stagnate. This drawing off of the waters is effected two ways: for either an issue is procured for them, by piercing the place where they accumulate; or, being re-absorbed and mixed with the circulating fluids, they are expelled by vast passages from the body.

1. By puncture, an issue is made for the water collected in the larger cavities of the body. At §. 1218. it was shewn, how little was to be hoped from puncture, for the cure of an hydrocephalus. From what was said at §. 1219. it appeared, better success might be hoped from this operation in a dropsy of the breast. Under the next aphorism we shall treat of the paracentesis of the abdomen, for the cure of an ascites; and the paracentesis of the scrotum, in a hydrocele, will be considered at §. 1252.

2. But when the water is lodged in the smaller cavities, the paracentesis does not take place; but a wider wound, made by caustics or blisters: or the part should be pierced with several punctures, in such a manner, that the water collected in the adipose membrane may have a free issue; and this method is useful principally in an anasarca, of which we shall speak at §. 1242.

3. This discharge by urine cannot be obtained, unless the watery serum collected in the cavities be re-absorbed, and afterwards secreted by the kidneys: by what method and remedies this is to be obtained, will be seen at §. 1243.

4. It is obvious, that the collected water cannot be discharged by vomit, unless it get into the cavity of the stomach; and to that end it must first be taken up again into the circulation. But as it is much more easily discharged by stool, urine, or sweat, therefore, at §. 1244. where we treat of vomits, we insist on that effect of vomits principally, which results from the concussion of the muscles in vomiting, by which the



the stagnating fluids may be dissolved, set in motion, and expelled; and thus frequently the obstacles be happily removed, which gave rise to the dropsy. And emetics, especially the more violent sort, generally give stools also.

5. We easily see that water stagnating in the cavity of the abdomen cannot be evacuated by stool, unless it be first resumed into the circulation by the absorbent veins. On this account we shall find (§. 1247.) strong purges recommended, which not only evacuate but dissolve, and agitate vehemently; therefore they are to be given in repeated doses, with short intervals between the doses, as the patient's strength will bear.

6. This method seems sufficiently safe, as it scarce excites any disturbance in the body; but it is very troublesome to the patients, and few have the constancy to support it. For by exciting a great heat, the stagnating water is rendered more apt to be resorbed; and as this heat promotes also perspiration and sweats, there is hope that all the superfluous fluid thus resorbed may be exhaled by the pores of the skin. Of this we shall treat at §. 1248. But in the use of this method, thirst must be patiently endured, and dry food be the only diet, lest the water, which heat had dispersed, should be returned again to the habit. Hence this method may rightly be called a drying of the dropical body, of which we shall speak at §. 1249.

But as unwearied patience is necessary, Celsus had good reason for saying, that slaves who can be compelled to endure all requisite severities, are more easily cured of the dropsy than free men: *Si enim ex toto sibi temperare non possunt, ad salutem non perducuntur*; "for if they cannot entirely command themselves, it is impossible to restore them to health<sup>a</sup>." And a skilful physician, a disciple of Chrysippus, very justly asserted, that a man, who had but a slight degree of a dropsy, could not recover, because he was notoriously intemperate. And when another physician, Philip of Epirus, promised a cure, he ingeniously replied, *Illum ad morbum ægri respicere, se ad animum*; "You regard  
" di-

<sup>a</sup> Lib. iii. cap. 21. p. 161.

the disease only, but I consider also the man's disposition." And the event confirmed the justice of the observation: *Ille enim cum summa diligentia, non medici tantum, sed etiam regis, custodiretur, tamen malagmata sua devorando, bibendoque suam urinam, in exitum se precipitavit*; "for although he was diligently watched not only by his physician, but by the care of the king Antigonus himself also, yet by eating his malagmata, and drinking his own urine, he hastened his death<sup>b</sup>."

It is easy to see that this method can take place only where the strength is not gone, nor the disease of very long standing. For if, for instance, the abdomen be prodigiously distended, scarce any hope of resorption remains: and at the same time there is room that heat may dispose the stagnating water to putrefy, by which means the viscera would soon be corrupted and death ensue; and that so much the sooner, as in this method of cure all drink is refused to the patients, or at least granted very sparingly; so that whatever putridity may have arisen from long stagnation of the fluids and increased heat, cannot be diluted nor washed off from the body. Which justifies the remark of Celsus: *However, at the beginning the cure is not very difficult, if rest, thirst, and fasting, be strictly enjoined; but if the disease has continued long, it is not removed without great trouble*<sup>c</sup>. Now although motion is in general useful for dropical persons; yet they cannot bear it, when they must endure thirst and fasting at the same time. At this day absolute fasting is not usually enjoined; but the patients sometimes live on biscuit only, as we shall see hereafter.

§. 1239. **I**F the cause of an ascites be recent, and suddenly produced from an external cause; if the strength be entire, the patient young, the viscera sound, and not injured by some  
VOL. XII. K k other

<sup>b</sup> Ibid.

<sup>c</sup> Inter initia tamen non difficilima curatio est, si imperata sint corpori quies, sitis, inedia: at si malum inveteravit, non sine magna mole discutitur. *Ibid.*

other disease; if the water be not putrid, nor yet long confined in the cavities, the paracentesis is immediately to be performed.

We have seen already at §. 1219. that water lodged in the thorax has been drawn out from the breast by tapping, with good success. When, therefore, a like collection of water was lodged in the cavity of the abdomen, it was natural to think of drawing it out from thence by the like means; for nature herself has sometimes pointed out this method. There are many instances in Shenck<sup>a</sup> of cases, where, the navel first becoming protuberant and afterwards bursting, the waters have flowed out, and health has been perfectly restored; and one in particular of a man of sixty years old, to whom this happened, and who was perfectly cured of the dropsy, and died past seventy of another disease. The like instances are to be found in Forestus<sup>b</sup>. A woman was so swelled with an ascites, that the great Dr Mead pronounced the disease incurable, as her strength was gone: but the abdomen bursting spontaneously, there issued twelve pints of water; and the next day, by a second rupture, six pints came out: both these openings were made, not at the navel itself but near it. This patient however was so faint, and as it were just expiring, that the doctor ordered a cordial, and foretold that she would soon die: but two months afterwards, to his surprise, he saw her alive, quite cured of the dropsy, and the openings in the belly were closed up of their own accord, which made him conclude, *Mulieri, ne mortuæ quidem, credendum esse*<sup>c</sup>.

It should seem, therefore, that art may follow, and imitate, the method pointed out by nature: yet physicians are not unanimous in their opinion of the usefulness of tapping. For as it has some times happened, that, from the neglect of proper cautions, some patients have died presently after the operation; and that the abdomen in others have swelled again, and that

pretty

<sup>a</sup> Observat. Med. lib. iii. obs. 18. p. 439.  
obs. 33. p. 379.

<sup>b</sup> Tom. II. lib. xix.

<sup>c</sup> Monit. et Præcep. Med. p. 154.



pretty soon after, by new water accumulating there; and as they considered that tapping did not remove the disorders in those bowels which gave the first rise to the dropy; many have condemned this operation as hurtful, and others rejected it as useless.

In Cœlius Aurelianus<sup>d</sup> we find collected the different opinions of those who condemned tapping. These opinions he well refutes, and then inveighs against them thus: "That all persons on whom the paracentesis is performed die (as they say), is a manifest falsehood: very many do indeed die, because, through the hesitation and delay of the physician, recourse is had to this operation too late." Besides, he well remarks, that although the cause which first produced the dropy be not removed by tapping, yet many troublesome symptoms of the disease are abated thereby. And as, in other diseases, physicians are used to administer many remedies which regard not the causes but the symptoms, there is no reason why tapping should not be applied for the same purposes. Hippocrates<sup>e</sup>, treating of the cure of an ascites, advises, if other remedies and proper diet are of no effect, that the water should be let out by cutting; and he would have this done about the navel, or backwards, about the flanks; and then says, *Inde vero pauci etiam evadunt*, "Hereby some few persons recover."

Sydenham<sup>f</sup> did not approve of tapping; for after he had expressed his dislike of vesicatories, from the fear there is of a mortification, he adds what follows: "Nor with happier success or less danger, in my judgment, is tapping performed, than vesicatories are applied." I well know, that several other physicians, of no mean note, place little hopes in this operation; and some of them absolutely condemn it. It will appear, I hope, from what shall follow, whether or not they have reason on their side.

Certainly Celsus, after he has spoken of the cure of this disease, directs thus: *If by such remedies the*

K k 2

belly

<sup>d</sup> Morb. Chron. lib. iii. cap. 8. p. 478, et seq.  
<sup>e</sup> cap. 6. Charter. Tom. VII. p. 627.

<sup>f</sup> De Affect. De Hydrope, p. 635.

belly is not dried, but the water notwithstanding abounds: a more speedy method must be taken to relieve, that is, to discharge it by the belly itself<sup>g</sup>. He confesses, that Erasistratus condemned the paracentesis, because he thought the only cause of a dropsy was a vitiated liver: wherefore he adds the following judicious remark, *Yet unless the water, which stagnates there preternaturally, be discharged, it will injure the liver and the other internal parts<sup>h</sup>*. Nor did he expect a cure of the dropsy from tapping alone, nor thought that all dropical persons could be recovered by this method: for he confesses, *Care should be taken nevertheless to cure the whole body; for discharging of the water does not work a cure, but makes room for the operation of medicines, which that obstructs while it remains there. Neither does this admit of any dispute, that all in this disease are not to be thus treated<sup>i</sup>*.

All who have wrote on the dropsy agree, that the water lodged in the cavity of the abdomen must be removed from thence: but all are not willing to adopt the speedy method of Celsus, that is, to pierce the abdomen, and let out the water by the wound. They endeavour by emetics, strong hydragogue purges, diuretics, &c. to evacuate the waters; or by thirst, and great heat, to dissipate them; not without great inconvenience to the patient, insomuch that few persons can or will submit to it. Whereas, in a short time, without any considerable pain, and without danger, the same end may be attained, if this operation be skilfully performed: for only the common integuments, the abdominal muscles, and the peritonæum, are pierced; and the water in the cavity of the abdomen keeps the peritonæum apart from the viscera, so that there is no danger of wounding the viscera by the

<sup>g</sup> Si per talia auxilia venter non siccatur, sed humor nihilominus abundat, celeriori via succurrere, ut is per ventrem ipsum emittatur. *Lib. iii. cap. 21. p. 165, 166.*

<sup>h</sup> Tamen aqua, nisi emittitur, quæ contra naturam ibi substituit, et jejuni, et cæteris interioribus partibus, nocet. *Ibid.*

<sup>i</sup> Corpus nihilominus esse curandum. Neque enim sanat emissus humor; sed medicinæ locum facit, quam intus inclusus impedit. Ac ne illud et quidem in controversiam venit, quin non omnes in hoc morbo sic curari possint. *Ibid.*

the instrument. Besides, the trocar needle is presently drawn out again, and only a hollow obtuse pipe remains in the cavity of the abdomen, so that, the waters flowing out, when the abdomen is contracted, either spontaneously or by the means of bandages, there cannot even then be any fear of injury being done to the viscera. The wound is small, and becomes almost imperceptible, when the integuments of the abdomen corrugate on the discharge of the water, and often heals. The operation of the paracentesis, therefore, is not dangerous of itself; and it soon draws off the water from the abdomen, either all at once, or (if the physician thinks this way the best) by puncture repeated at intervals; of which we shall speak under the next aphorism. If, from the abdomen not being sufficiently braced, or from any other cause, the patient grows faint, and swooning is apprehended, the end of the canula may presently be stopt up with the finger, till wine or some cordial be given to support the strength.

Do not emetics and strong purges, often repeated, and even strong diuretics, offend the body more than so slight a puncture? All those remedies can then only be of service, when there is yet a possibility of re-  
sorbing the water lodged in the abdomen: unless this can be done, they take away nothing of the watery load, but only diminish the quantity of healthy fluids. It is indeed true, that by the dissolving power of purges and diuretics, and by the violent concussions of a vomit, obstructions in the viscera, which occasion a dropsy, are sometimes removed: but it is equally true, that the viscera, when they have been long soaked in the water, and rendered tabid and unsound, may be torn by these violent agitations. It is equally true, that hydragogue purges may dissolve the texture of the blood, and that too great a tenuity of the fluids is one cause of a dropsy. No one can suppose, that schirrhous obstructions in the viscera, which so often occasion a dropsy, can be dissolved by these remedies; so that there will be need of other means of cure (if any cure be possible) after the waters are drawn out.



May not a better effect be hoped from such remedies, if they are administered before the strength is impaired by the violent operation of purges, &c.?

I think, if any person examines the matter without prejudice, he cannot doubt that it is safer to draw off the water in an ascites by tapping, than by strong emetics and cathartics.

What then can be the reason, why men famous in our art have condemned it, nay, have affirmed that it hastens death? The answer is easy: They performed this operation after they had in vain tried other methods; after the patient's strength was sunk, and the viscera, soaked in half-putrid water, were corrupted. This opinion has been almost universal, that every thing should be tried before tapping. Hippocrates himself says, *If by remedies alone the patient finds relief, and the belly grows soft, it is well; but if not, making a wound lets out the water*<sup>k</sup>. It is not therefore strange, that few should escape. Cœlius Aurelianus<sup>l</sup>, although he acknowledges, that, of the remedies against dropsies, "some offend the bladder; others "irritate and ulcerate the intestines, or occasion a "dysentery; others turn the stomach, or cause a "loathing of food, and increase the thirst:" yet advises violent remedies, such as the hellebores, euphorbium; squills, &c. and he subjoins, "If there is no "diminishing the water, then (as being foreign to "the body) it should be let out by puncture." However, he defended the usefulness of tapping, against its opponents, as we have seen a little above. Tulpius<sup>m</sup>, who certainly was not favourable to it, but rather considered it as seldom useful, and often hurtful; yet, with his usual candour, confesses, "So "much time is consumed in the use of remedies "which draw off the water by stool, that puncture "is scarce attempted till the viscera are injured by "the long duration of the disease."

Cel-

<sup>k</sup> Si igitur a medicamentis, et reliqua victus ratione, juvetur, et venter molliatur; sin minus, sectione facta aquam educere oportet. *De Affect. cap. 6. Charter. Tom. VII. p. 627.*

<sup>l</sup> Lib. iii. cap. 8. p. 471.

<sup>m</sup> Observ. Med. lib. ii. cap. 38.

Celsus<sup>n</sup> acted more prudently, when he endeavour-  
d, by motion, and a discutient malagma bound on  
with rollers, to dissipate the water of the ascites. If  
the liver or spleen were affected, he applied just over  
them a mellow fig bruised, with the addition of ho-  
ney. If no good success followed these applications,  
he took the more speedy method of relief, by dischar-  
ging the water immediately from the belly: but he  
says nothing of using violent purges in an ascites be-  
fore puncture was tried.

But when the belly is not yet swelled to an im-  
moderate size, and the disease young, it will be right to  
try powerful remedies, in the hope that the waters  
may be evacuated by various passages from the body;  
and indeed the patients themselves are not willing to  
undergo the operation, till other methods have been  
tried without success. But this caution cannot be too  
much inculcated, that we should not persist very long  
in the use of evacuating remedies, if the swelling does  
not decrease, but remains as it was, or grows bigger.  
Celsus's advice merits our regard: *It is convenient like-  
wise to measure the belly every day with a thread, and to  
put a mark on it where it meets: and each succeeding  
day to observe, whether the bulk be enlarged or dimin-  
ished; for that which lessens, feels the effect of medicine.  
Nor is it improper to measure the patient's drink and his  
urine; for if more moisture is excreted than is taken, in  
such a case there is hope of recovery.*" It is therefore  
better to have recourse early to tapping, than to ex-  
haust the patient's strength by violent remedies.  
Hippocrates directs<sup>p</sup>, "That dropfical patients should  
be soon cut." But if after long diseases and fre-  
quent returns a dropfy should arise, he absolutely for-  
bids the operation<sup>q</sup>.

But

<sup>n</sup> Lib. iii. cap. 21. p. 165.

<sup>o</sup> Commodum est, etiam lino metiri ventrem quotidie, et qua compre-  
hendit alvum notam imponere: postero quoque die videre, plenius cor-  
pas sit, an extenuatur. Id enim quod extenuatur medicinam sensit: ne-  
que alienum est metiri et potionem ejus, et urinam; nam si plus humoris  
excernitur quam assumitur, ita demum secundæ valetudinis spes est. *I-*  
*bid.* p. 163.

<sup>p</sup> Fæsius, Tom. II. p. 1195.

<sup>q</sup> De Intern. Affect. cap. 46.

Charter. Tom. VII. p. 672.

But this operation is then most safely performed, and with the most rational hopes of success, if the dropsy be occasioned, not by any disease which has impaired the bowels, but from a recent external cause suddenly operating on the body, till then in good health; as when, for example, too great a quantity of cold liquor is hastily drank, (see §. 1229.) and the abdomen from this cause swells suddenly; then certainly the water may with greater safety be let out by tapping; before the parts are more distended, and the viscera compressed by its stagnating long in the cavity.

Here, however, as in all other methods of cure, caution is necessary, lest, if the operation be rashly undertaken, death should ensue; or at least, that the physician should not seem to have killed him who could not have recovered. For this reason, the circumstances are here enumerated, the presence of which will assure the physician, that not only relief, but a cure may be expected from the operation of a paracentesis, and that will be attended with no danger to the patient. If all these circumstances concur, there is undoubtedly no manner of danger: but it very rarely, or scarce ever happens, that a dropsy attacks a young robust person, without any disorder of the bowels, or any other distemper having preceded, unless this disorder takes rise from an external cause suddenly operating on the body. Therefore, if all these conditions were necessary to warrant the operation, it could hardly ever take place. Before, at §. 1230. those symptoms were recited, from which the physician might foresee what would be the event of a dropsy: and if all the good symptoms met together, then “the patient may certainly expect to recover:” but if not all, yet “if he have many of these, there “is hope that he may escape.” The same observation is in force in deciding concerning the paracentesis: for if many of the good signs be present, altho’ not all, yet it may be tried with some hopes of success; and the event has often shewn, that it was useful even to such persons as appeared irrecoverable. A  
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young woman had an ascites, which gradually increased for three years to such a degree, that it was feared the belly would burst; her whole body was emaciated; but as, by the distension of the parts from the water, she suffered intolerable pain, she was desirous of being tapped in hopes of ease, as else she must waste away and die a lingering death from constant torments. Dr Mead, although he pronounced that the operation could not be performed without extreme danger, yet, overcome by her intreaties, consented<sup>r</sup>. The abdomen being pierced, sixty pints of a clear humour, void of all stench, were drawn out at once: her strength increased daily, the dropsy never returned, and ten months after she bore a healthy male child, and had several children afterward. Who would have thought, that, in a dropsy of so long standing, the waters were not grown putrid? Who would not have feared, that the viscera, so long soaked in it, should have been, if not quite corrupted, yet have lost their tone and firmness? Yet her strength returned; and in a month after, she was capable of conceiving a child, of nourishing it in her womb, and bringing it happily in its full time to the birth.

This operation has not always however (nay indeed very seldom) so happy success, as that not only the water should be discharged, but that there should be no relapse. Sometimes morbid causes lie concealed in the viscera, which do not shew themselves till after the water is let out, especially if the physician does not see the patient till the belly is remarkably swelled. It has often happened to me, that, after tapping, I have felt hard swellings in the belly emptied of the water, which persuaded me that the dropsy would return; yet I did not repent having advised letting out the water.

For a signal relief is procured to the patients: and although the letting out the water does not cure, yet it gives room for remedies to operate. I tapped one woman three times, although I plainly felt such hard swell-

swellings: she survived almost four years, and that in tolerable ease, and in a capacity of doing her usual household work; and undoubtedly would have lived longer, if she had not died of another cause: for her husband, tired of an unhappy life, hanged himself; and his wretched wife not suspecting any such thing, going into his bed-chamber, found him hanging, and presently fell into a syncope, which was followed by a violent fever, which soon killed her.

Tapping is therefore useful, although it does not remove the cause of the dropsy: nay, although the cause be unsurmountable, and such as brings on frequent returns of the dropsy, for the paracentesis may also be frequently repeated. Certainly, when a disease is incurable, it is no small point gained to abate considerably the uneasiness and pain of it, and to prolong life. From numerous instances for our purpose, it will be sufficient to select one. A man forty-nine years old, labouring under an ascites and an anasarca at the same time, was so far cured by Dr Storck, with wine of squills, that he returned to his accustomed labours; but there still remained a hard swelling in the epigastric region. The physician tried various remedies, but the patient neglected his directions; the disease returned, and would no longer yield to remedies. The operation being performed, an hundred pints of muddy water were drawn out, and the swelling in the epigastrium was perceived to be much more extended. Various things were tried without success; and a month afterwards, fear of absolute suffocation made tapping again necessary: nearly the same quantity of a like fluid came out. This puncture was obliged to be repeated, monthly, seven times more. For a fortnight he seemed somewhat better, but he swelled again prodigiously: weakness, loss of appetite, feverishness, and sweats, dissuaded repeating puncture the eighth time; which the unhappy sufferer however resolved to undergo, fearing suffocation, or bursting of the belly: almost an hundred pints were let out, which relieved him indeed for the present; but his strength gradually  
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inking, he died<sup>s</sup>. On opening the body, the omentum was found hanging down even into the pelvis, and changed into a thick bag; which inclosed a steatomatous swelling, which weighed three medical pounds. In the cavity of the abdomen was no water, but a great quantity of red fetid liquor in this bag.

The cause producing so frequent returns of so great dropsy was incurable; the needle must have pierced the bag at the omentum to let out the water; and yet life was prolonged many months in a man just ready to be suffocated, and his insupportable anxiety was removed.

Nor is it easy to determine what number of these operations persons who have an ascites may bear, and receive relief from them, before they sink under the incurable disorder of the corrupted viscera. A Swiss soldier bore tapping fifty-seven times, in the space of twenty-one months. The dropsy returned so fast, that it required the operation to be repeated every eleventh or twelfth day: for the lymph was so readily and speedily extravasated into the cavity of the abdomen, that various qualities were observed in the water let out, corresponding to the variety of aliments taken by him. If he had eaten chervil and cressles, the waters were green; they turned red after he had been drinking red wine, were more limpid after he had been drinking white wine, and had a strong smell when he had eaten garlic and onions<sup>t</sup>. A widow lady, who fell into an ascites when she was fifty, underwent tapping yet oftener. It was performed monthly, and the first year four pints were drawn out at each time: the second year forty-eight pints collected, and were discharged every month: the third year the quantity was so far diminished, that only twenty-four pints came out monthly by tapping: but in the fourth, fifth, and sixth years, she was tapped thirty times in the space of seven months, but not more than sixteen pints flowed out each time. She began to languish and waste away, to breathe with difficulty, and to be subject to faintings.

<sup>s</sup> De Haen. Rat. Med. Tom. IV. p. 87. Storck Ann. Med. p. 146.  
<sup>t</sup> Acad. des Sciences, l'an 1721. Hist. p. 38.



ings. At last she grew tired of life, and of the operation; and died quietly, after having been tapped sixty-six times, and having had one thousand nine hundred and twenty pints of water drawn from her. Her life, therefore, was prolonged several years; and the disorder so much relieved, that, after the water was drawn out, she enjoyed company with cheerfulness, and took pleasure in exercise, and even in dancing: and she directed in her will, that for a memorial of the case, the number of operations, and the quantity of water discharged, should be inscribed on her monument; as also that she bore the disease without repining, and always submitted to the operations without fear <sup>u</sup>.

From these instances we see, how useful tapping is; how often it has restored health; has almost always given great relief; and has at least prolonged, if not saved the patient's life, if attempted with proper cautions; of which more presently.

It is indeed true, that tapping is most advisable when the viscera are still sound, and not impaired by some other disease, and the water has not stagnated so long as to become putrid. But it does not seem that we ought absolutely to reject this remedy, even though there be a suspicion of such disorders existing. Sydenham <sup>v</sup>, who for this disease made use of strong emetics and cathartics, candidly acknowledges that the dropsy cannot always be cured. He well knew, that in an inveterate ascites the viscera became corrupted; and therefore readily saw, that in this situation violent remedies were not safe, the disease being beyond the reach of art. However, he adds what follows, and it is well worthy of note: "Nevertheless, as the physician cannot certainly tell how much  
" the bowels are injured, he ought to do his best to  
" forward the cure by evacuating and strengthening  
" medicines, and not to lose all hope himself, or  
" cause the patient to despond. And it is for this  
" reason his duty to act thus, because in abundance  
" of

<sup>u</sup> Mead *Monita et Præcepta*, p. 148,—151.  
p. 532.

<sup>v</sup> Swan's edition,

of diseases, when the morbid matter is quite carried off, nature, which perpetually helps us, contrives spontaneously, in a wonderful manner, to expel the pernicious remains of the distemper. Hence every kind of dropsy, how obstinate soever it prove, and how much soever it may have injured the bowels, may be treated in the same manner as if it was recent."

Let all prudent physicians judge now, whether it could not be safer to try tapping, when we fear that the waters are putrid, or that the viscera are in a very bad state, than to agitate the body violently by strong emetics and cathartics. The well-attested instances enumerated above, easily determine our choice. A woman, who had been in a languishing and diseased state for six whole years, began to swell with an ascites, so as to need being tapped. This operation was afterwards repeated twelve times in fourteen months, and seven hundred and sixteen pints of water were drawn out in all. At the eighth puncture, the water came out fetid. The four following times less stench was perceived: however, the silver pipe was drawn out stained with a bluish colour; and the three last times there was observed, after the letting out of the water, a round body that slid down from the epigastrium to the os pubis. After her death, the body being opened, there was found a tumour suspended by a narrow stalk from the navel, and adhering to the peritonæum in several places, and it weighed eight pounds. In this case therefore, after the waters were become fetid, this woman found relief four times from tapping, although there was such a large tumour in the belly<sup>s</sup>.

But tapping was also thrice performed on a woman who was pregnant, but knew it not, and who had at the same time a bearing-down of the womb; and that so successfully, that the strength and plumpness of the body increased after every tapping; and six months after the first operation she bore a healthy child, and afterwards was quite restored to health herself: and in this woman the dropsy increased so fast, that there

was a necessity of drawing out the water three times in nineteen days, in the third and fourth months of her pregnancy. Thus tapping preserved both the mother and the child.

I might collect many more instances, which evince the usefulness of this operation; but these are sufficient to shew how much may be hoped from it.

It follows, that we see what rules are to be observed for performing this operation without danger, and even repeating it if the obstinate nature of the disease shall require it.

§. 1240. **I**N performing this operation, the puncture is to be made three inches below the navel, and at the same distance from the linea alba, (measuring as if the body was sound) on the side opposite to the seat of the dropsy, by making a puncture with a suitable instrument. The water is to be let out, in a small quantity, twice a-day, taking at least fifteen days to evacuate the whole; giving, in the mean while, the remedies directed at §. 1233, to 1238.: Or, by the modern method, the abdomen is to be compressed by bandage in proportion to the water discharged, lest the lax and pendulous viscera and vessels should fluctuate in the emptied abdomen.

From what Celsus<sup>a</sup> has written concerning the paracentesis, it appears, that they sometimes pierced the navel itself. But some operators made the opening four fingers breadth below the navel, on the left side. We have seen already, that the navel sometimes bursts, and lets out the waters: hence, perhaps, the puncture might be attempted here, if the navel bunching out indicated this way of discharge. However, there is good reason for chusing a more dependent part, than the evacuation of the waters may be the easier. But

<sup>a</sup> Lib. vii. cap. 15. p. 481.



As the abdomen is sometimes prodigiously swelled in an ascites, the distance of the puncture from the navel should be greater in proportion as the swelling is more considerable. The best way of fixing the place of puncture, is to measure the distance between the navel and the edge of the os ilii, and push in the trocar just in the midway between both. Surgeons usually mark the place indicated for the puncture with ink; and if the abdomen be enormously swelled, they chuse a place still lower. By this means sufficient care is taken, that neither the linea alba nor the tendinous sheath which wraps up the muscoli recti of the abdomen can be hurt, (as from the wounding of tendinous expansions, pain and other grievous symptoms are used to follow.) Tho' in general the operation may be performed with equal safety on one side of the abdomen as on the other; yet it is here directed to be made on the side opposite to that wherein the dropsy is originally seated. The reason of which direction is this: Very often this disease arises from a schirrhous of the liver or spleen, as has been said before. Now, as schirrhous viscera grow to a very great bulk; therefore if, for instance, we suspect a schirrhous of the spleen, the puncture is made on the right side, lest, (if it were made on the left side, in which lies the spleen) after some part of the water is drawn off, the schirrhous should press on the orifice of the pipe, and impede the discharge of the rest. Celsus<sup>b</sup> also cautions us to take great care, *ne qua vena incidatur*, "that no vein be cut:" for we often see, that the cutaneous veins in the abdomen swelled in an ascites, are very large and varicous. It is true indeed, that no very dangerous hæmorrhage is to be feared from cutting a vein: but the bystanders are alarmed; and, if any thing amiss should follow, would lay the blame on the surgeon, as not having been sufficiently careful. Garengeot<sup>c</sup> has remarked also, that little ulcers sometimes follow on these veins being hurt. But this can easily be avoided, as the puncture may be safely made

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<sup>b</sup> Ibid. p. 451.<sup>c</sup> Operations de Chirurg. Tom. I. p. 249.

at some distance from the place determined by the measure.

Altho' the patient might undergo the operation conveniently enough sitting in a chair, yet most practitioners chuse it should be performed in bed; the patient lying on one side, in such a manner, that the swelling of the abdomen comes out beyond the edge of the bed. Thus the fatiguing the patient is avoided, and the bed is not liable to be soiled by the discharge of the water.

Now this question comes to be considered, Whether all the water from the abdomen should be let out at once, or at intervals of time? Physicians and surgeons have been of different opinions on this head, and formerly indeed all maintained that the water could not be let out all at once without great danger. The unanimous sentiment of the ancients confirmed this opinion, as the unhappy events which followed the evacuating all the water at once, in improper circumstances, seemed to demonstrate the truth of it. Many persons believed, that, together with the water, there issued forth some subtle spirituous effluvia, absolutely necessary to life. 'This seems to have been the opinion of Celsus, when he says, *Some with good reason will wonder, how any thing can at once both be hurtful to our bodies, and in part conduce to their preservation: for whether a dropsy has filled one with water, or a great quantity of pus has been collected in a large abscess; for the whole to be discharged at once is equally mortal, as for a sound person to lose all his blood by a wound*<sup>d</sup>. Certainly Hippocrates directs an actual cautery to be applied to the belly, and the water to be let out by little and little. Nay, elsewhere he prognosticates certain death from the contrary practice: "They who, having an empyema or being " dropfical, are cauterized; if the pus or water be " all

<sup>d</sup> Illud jure aliquis mirabitur, quomodo quædam simul affligunt nostra corpora, et parte aliqua tueantur: nam si ve aqua inter cutem quem implevit, si ve in magno abscessu multum puris coit, simul id omne effudisse, æque mortiferum est, ac si quis sani corporis vulnere factus exsanguis est. *Lib. ii. cap. 8. p. 72, 73.*

<sup>e</sup> De Intern. Affect. cap. 26. Charter. Tom. VII. p. 637.

“all discharged at once, they certainly perish †;” (as we mentioned before, at §. 1219.) Galen, in his commentary on this passage, endeavours to give a reason for this prognostic; because, says he, some arterial vessels are opened, to which the pus before served as a stopper: now, the pus being discharged all at once, much spirit or air rushes out with it, to the injury of the patients. It is well known, that the ancients thought air, rather than blood, was contained in the arteries; and in dropfical persons, they thought, that a sudden evacuation of the water was hurtful, not only on this account, but also because the schirrhous (of the liver suppose, which is one cause of the dropfy) being no longer sustained by the water, would fall and draw downwards with it both the diaphragm and the contents of the thorax. And because they chose to draw off the waters by degrees, for this reason they preferred the actual cautery to cutting; as the place that is burnt will not close without suppurating first, but the lips of a wound made by cutting soon unite. Celsus confirms this; *Others first cauterize the skin, and then make an incision through the interior integuments, because what is divided by the actual cautery unites less quickly* ‡. Celsus made the wound with an iron instrument, into which he afterwards introduced a leaden or brazen pipe, through which the water was to be evacuated; and directs, that when the greater part of it was discharged, the pipe should be stoppt with a bit of linen, and left in the wound, if it was not cauterized; then, on the following days, a hemina (about three quarters of a pint) is to be let out every day, till no water appears to remain. But he observes, that some even take out the pipe, altho’ the skin has not been cauterized, and tie over the wound a sponge squeezed out of cold water or vinegar, and the day following introduce the pipe again, (which the recent wound, by being a little stretched open, will admit), that so, if any water remain, it may be

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† Aphor. 27. sect. vi. Charter. Tom. IX. p. 263.

‡ Quidam, cute primum adusta, deinde interiore abdomine incisa, quia quod per ignem divisa est, minus celeriter coit. Lib. vii. cap. 15. p. 451.



evacuated. These latter, therefore, were bolder practitioners, as they drew out the whole quantity at two discharges.

It is certain, that when the water is let out all at once, the viscera, which were before compressed, now fluctuate at large in the emptied abdomen; their vessels, before compressed also, now are more easily dilated by the fluids propelled from the heart: whence sometimes almost all the blood passes into these unresisting places, and none, or but a small quantity, tends to the superior parts; hence all the vessels of the brain suddenly collapse, and there is room to apprehend a fatal syncope. A like misfortune sometimes happens to child-bearing women, who by quick, and to appearance happy, efforts, are delivered of the waters, foetus, and secundines, presently after one another; whence the blood suddenly and impetuously rushes into the dilated vessels of the womb, and also passes in greater quantities into the vessels of the other abdominal viscera, now no longer compressed by the bulk of the distended womb: but the abdomen, immediately after delivery, being gently braced up with a broad linen cloth, this evil may be prevented; as we shall see hereafter, in the chapter of the diseases of child-bed women. It is true indeed, that in delivery, the placenta being separated from the womb, the blood flows in streams from the gaping necks of the uterine vessels, which augments the danger. But in the case we are now considering, there is also a fear lest the viscera, which have been so long soaked and softened in the collected water, should be so weakened, as to burst by the impetus of the blood flowing more freely into them, or that the orifices of their vessels would be so much dilated as to let out the blood by an anastomosis. This seems to be the reason why the waters issue limpid at the first tapping; and, if it be repeated, flow out tinged with blood<sup>h</sup>.

Monsieur Du Verney junior<sup>i</sup>, to obviate this danger, advises the using a narrow pipe, that the waters may

<sup>h</sup> Monro on the dropsy, p. 73.  
Mem. p. 184.

<sup>i</sup> Acad. des Sciences, l'an 1703.

may flow forth less impetuously; and that the discharge of the waters be every now and then stopt, that time may be given for the distended parts to contract themselves by their natural elasticity. He directs likewise, that the abdomen should be pressed with the hand, or braced up with rollers, as is customary to do with women immediately after delivery; and that at the same time, if the patients grow faint, they should be revived with broth, or with generous wine, than which there is scarce any better cordial. But if the pipe be very narrow, and the waters should be viscid, the discharge will be difficult; and a narrow pipe may be easily stopped up by little membranes coming out with the water: wherefore, provided the abdomen be properly compressed while the waters flow out, we may safely use a larger pipe. This is well confirmed by Mead<sup>k</sup>, who being desirous to know what effect the compression of the abdomen, after the puncture, had towards preventing the danger of sudden death; as soon as the waters began to issue from the wound made by the trocart, putting his hands on each side above the navel, carefully pressed the abdomen downwards, directing the surgeon at the same time to press the lower part of the belly in like manner: "He observed, that if he removed his hands but for a moment, the patient was immediately on the brink of swooning." The waters being all drawn out, the abdomen was wrapped round tight with flannel rollers, a flannel cloth dipt in spirits of wine having been first put upon it. The patient recovered, and never had a relapse.

But as this pressure with the hand requires more than one person; and as a roller is to be wrapt round the abdomen after the waters are drawn out, which cannot be done without removing the hands, so that there would be danger of a syncope in the interval between the taking off the hands and the binding; Doctor Alexander Monro contrived a belt, which he has described<sup>l</sup>, which is put round the abdomen before

<sup>k</sup> *Monita et Præcepta Medica*, p. 146.  
*observations*, Vol. I, n<sup>o</sup> 18. p. 218.

<sup>l</sup> *Medical essays and*

fore the puncture is made, and drawn close by buckles as the water flows out, in such a manner as that there constantly remains an equable pressure; and when the water is all drawn out, the belt may remain, and there will be no need of other rollers.

This belt I have used always with good success, and have known others do the same; so that not only fifty-six pints of water (as this excellent author rejoiced he had been able to do) were let out at once, but even an hundred pints, without any fainting. This gentleman has also more precisely determined the place of puncture<sup>m</sup>, namely, just in the mid-way between the navel and the crest of the *os ilii*: but as this crest has a great extent, hence even this direction does not exactly enough answer the precise point; wherefore he informs us, that the safest part for making the puncture, is half-way between the navel and the anterior process of the *crista ossis ilii*, from whence arises the rectus muscle of the leg<sup>n</sup>.

Tapping is frequently performed every year in this manner, in the hospitals at Vienna, with good success; and we safely follow the advice of Cœlius Aurelianus: "The humour is to be discharged (if the circumstances will allow of it) by the catheter, all at one time<sup>o</sup>;" for he used the female catheter, after he had made a passage into the abdomen with a lancet: He also warns us to avoid "cutting cross the veins." He used pressure of the hands; but, as it seems, only to assist the discharge of the water: and he does not seem to have thought at all of rollers; for he only kept the dressing fast on the place of puncture, "with a slight bandage," if it were necessary to defer the entire evacuation of the water, "for the commotion in the body to subside: and then, resuming the operation on the same day, we draw off the residue of the humour; or else the next day, pressing the subjacent parts with the hands."

All the water may therefore safely be let out at one time, if the abdomen be braced with such a belt as we

<sup>m</sup> Ibid. p. 216.  
cap. 8. p. 483.

<sup>n</sup> Tabul. Eustach. 43. n<sup>o</sup> 30.

<sup>o</sup> Lib. iii.



we have mentioned, drawn cloſer and cloſer, in proportion to the quantity of water diſcharged. Thus great trouble is ſaved to the patient, and a better effect may be hoped: for if the diſcharge be made at different times, either the pipe muſt remain in the belly, from whence frequently an inflammation ariſes in the circumjacent parts, the contracted and corrugated integuments of the abdomen being preſſed and rubbed againſt the hard pipe; or if the pipe be taken out, ſo ſmall a wound ſoon cloſes, or at leaſt is ſo much contracted, that it cannot be introduced again without force, from whence troubleſome complaints uſually enſue. Wherefore Cœlius Aurelianus<sup>p</sup>, who made the wound with a lancet, and afterwards introduced a pipe, and therefore made a larger opening, directs, that if all the water cannot be taken away all at once, “ we ſhould perform, by making the opening in another place at each repetition: for the firſt wound, if kept open, will occaſion ſwellings; or if it be opened again after it has cloſed, will cauſe great pain to the patient.”

But the chief danger ſeems to be, that the putrefaction of the water may be accelerated by the air having had acceſs to it: for although the waters, before they have had any communication with the external air, may not yet have grown putrid; yet they may be ſo near it, as to putreſcy preſently on the admiſſion of air. A woman had been dropſical fifteen years. A gangrene aroſe under the navel, which afterwards ſeparated from the ſound parts, and left an opening through which the water, contained in the cavity, ruſhed out with great impetuofity, without any remarkable ſtench; yet this water, within a few hours after it was diſcharged, grew ſo ſtinking, that no one could bear the ſmell<sup>q</sup>. This water therefore could lodge in the body without being much corrupted, for ſo many years; but on the free acceſs of the air, was all turned putrid in a few hours. Sometimes alſo, a little before death, the water acquires a moſt terrible putridity; even ſo great, that a ſurgeon, performing the paracenteſis on a body, a few

h Ibid.

q Ruysch. Obſerv. Anat. Chirurg. n<sup>o</sup> 18. p. 18.

few hours after the patient's decease, from the putrid effluvia of the green-coloured serum which issued from the wound, was seized with a pestilential fever, from which with great difficulty he recovered <sup>r</sup>.

This sudden corruption of the waters stagnating in the abdomen, when the air gains admittance, seemed to have been the chief reason why great physicians despised the operation of the paracentesis, as almost all the patients died. The following case shews this <sup>s</sup>. A young man had an ascites, which increased slowly for six months: neither the lower limbs, nor any other part of the body, except the abdomen, were swelled; he had no oppression on his breast; he could lie down without inconvenience; his pulse was good, nor was any thing else in his body amiss; and no other disease had preceded the dropsy. The skilful surgeon justly concluded tapping might be attempted with good hope of success, in such a case, if ever. Nor did the physician deny his consent; but said, with a kind of smile, that the patient would not recover after the tapping, for that he had seen almost all persons die on whom this operation was performed. As the navel was very prominent, it was pierced with the needle, and six pints of water were taken away, (for it was not this surgeon's custom to let out all the water at once): the aperture was closed with yellow wax and proper dressings, in such a manner that not a drop of water could escape from it. On the evening of the same day, the same quantity was drawn out by the same aperture; and this was done daily twice a-day. All things went on happily till the twelfth day: the swelling of the abdomen subsided greatly, the patient seemed vigorous, his appetite was good, he had no fever, nor any other bad symptom. But scarce was the twelfth day ended, when a fever ensued, attended with a nausea; soon after, convulsions came on; the water, which had hitherto been limpid, came out dirty and fetid, staining the silver needle first with a violet, and afterwards with a black colour. He died the twenty-fourth day after

<sup>r</sup> Pringle on the diseases of the army.  
Ant. Bencivoli, p. 126.

<sup>s</sup> Dissertazioni di

after the first tapping. In the body there was found a small obstruction on the concave side of the liver; but the whole peritonæum was mortified, and a vast quantity of putrid fluid, of the most fetid smell, deluged the whole cavity of the abdomen.

Benevoli concluded from hence, that the free admission of the air, after so many punctures, might be accounted the cause of this putrefaction; and that therefore the water should be drawn off all at once from the cavity of the abdomen: in which opinion he was confirmed, by the case of a woman who had an ascites, whose navel swelling, ulcerating, and bursting, let out all the water suddenly, in so great a quantity, that forty pints were collected in several vessels; besides no small quantity spilt in the bed and in the chamber, before vessels were ready to receive it. This woman, in three weeks time, the rupture being closed, returned home from the hospital. The ascites returned again four or five years after, and went off by a discharge of urine.

It may perhaps be said, in opposition to this, that there are other instances which shew, that the water drawn off by tapping, does not always corrupt so soon, although exposed to the air. It was observed before at §. 1219. that a fluid drawn from the cavity of the breast, shewed no signs of putrefaction five days after death; nay, that, being put in a digester, it exhaled an acid odour, which however, after many days, turned to a very nauseous putrid smell. De Haen<sup>t</sup>, after he had quite evacuated the water from the abdomen of a woman who had an ascites, kept twenty-seven pints which he had drawn out, in glass vessels in the open air for a fortnight, without there being any sign of putrefaction; at the bottom subsided a thick jelly, in some of the vessels mixed with blood, and with pus in others: the thinner part which swam on the top, being put over the fire, presently coagulated; whence it was with reason concluded, that the greater part of the collected fluid was serum. It is however to be noted, that the disease was young, having scarce  
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<sup>t</sup> Rat. Med. parte iv. p. 73.



lasted five months before the patient was tapped; so that there was the less tendency to putrefaction. But the fluid let out began pretty soon to degenerate; for in eight hours time it began to form oblong white flakes from the surface downward, and the next day pus appeared at the bottom. It is true indeed, that the history of the disease shews, that there was good ground to suspect that the womb was suppurated: but it seems proper to remark, that Dr. Pringle<sup>u</sup> has observed, that the pure serum of blood, when disposed to putrefy, becomes thick and muddy, lets fall a white purulent sediment, and turns of a light greenish colour: now the fluid drawn from this woman was greenish and turbid, and the next day (although not immediately) shewed pus at the bottom. Whence it seems probable enough, that if part of the water drawn out had remained in the abdomen, the air having gained access, would, together with the heat of the body, soon have brought on putrefaction: for when the water is drawn off at separate times, a considerable time often passes before the complete evacuation can be made, as appears from the instance related by Benevoli.

At the same time it appears, that purulent matter may be formed in the serum of the blood when it degenerates, although no inflammation has preceded: which remark is of great moment, to the understanding those sudden metastases of morbid matter, sometimes observed in diseases, when on a sudden a tumour filled with pus arises in some part of the body; although no signs shew that there has been any abscess elsewhere, whose pus has been resorbed and deposited on these parts. It appears also, that the ancient physicians had good reason to call the change of the humours into pus, *putridity*; not however understanding by this absolute putrefaction, but such a degree in which there still remained something of concoction. See what was said on this head at §. 387. where we treated of an inflammation too violent for discussion, and tending to an abscess.

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<sup>u</sup> Diseases of the army, p. 420.

The instrument used for tapping is known to all; and is to be found described, with a figure annexed, in Heister, Garengot, and others; namely, a triangular, pointed needle, sheathed in a silver pipe, in such a mannner that the point sticks out; and so constructed, that, after the puncture is made, the needle may readily be drawn back, the pipe remaining in the cavity of the belly. It is common now to prefer a large pipe to one more slender; as, when the abdomen is duly supported and braced by the belt above-mentioned, there is no danger from the speedy effusion of the waters; and if they should be viscid, they will more easily find a passage through a wide orifice.

But it has sometimes been observed, that the cavity of the abdomen does not contain water easily flowing out, but there is found a tremulous kind of jelly, (as in the instance mentioned at §. 1226.) which will not come out even through a wide pipe, even when the abdomen is squeezed. It happened, in the case to which I now refer, that the first time a greenish water, like that in which asparagus has been boiled, and fluid enough, came out; and soon after, nothing at all, although the wound was dilated, the patient put into a warm bath, and warm liquors injected into the abdomen. The patient soon died, and the abdomen was found full of such a jelly<sup>v</sup>. And that woman, whom I mentioned, died in three days time; but I could not obtain permission to open the body.

In such a case nothing seems to be left, but to abandon the patient to his fate; or, by making a large opening, to procure a passage for the gelatinous matter contained in the cavity of the abdomen. We read<sup>w</sup> that this has been done: An incision five fingers broad being made in the abdomen, a jelly came out, but with difficulty, as it took two hours and a half for thirty-five pints to come out: the abdomen, however, was not quite evacuated; for on taking off the dressings fifteen pints more like a jelly issued forth, and more afterwards. The fourth day a diarrhœa came

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<sup>v</sup> Targioni Tozzetti osserva. Medic. p. 34, 35.  
<sup>w</sup> Mem. de l'Acad. Royale de Chirurg. Tom. II. p. 452.

on: the fifth, serous humour flowed out; the signs of a mortification and putrefaction ensued; and at last the patient died, on the thirteenth day after the operation. On opening the body, the right ovary, greatly dilated, was found to have been the seat of all this vast mass; and that the incision had penetrated into the cavity of this tumour, by an opening of about four fingers breadth. Two other holes were found made by the putrefaction, through which this jelly had passed into the cavity of the abdomen. Certainly it does not seem strange, as there was need of so large a wound, that the air acceding freely should have caused putrefaction.

Another wonderful instance happened at Paris\*. A robust, well-set man, of forty-eight, was tapped for an ascites: nothing issued from the wound at first; but when it was dilated, there came out a gelatinous matter of a grey and clay colour, thicker than the white of an egg, with a great quantity of hydatides equal to six measures, (a measure usually contains four pints); his strength kept up very well. The next day there issued again from the dilated wound, a great many hydatides of a larger size, equal to pigeons eggs; together with a bit of some white mass, looking like a portion of the omentum, to which several hydatides adhered by fibrous stems; and at the same time six measures of a like jelly came out. The number of hydatides, small and great, is related to have been seven or eight thousand.

On the sixteenth day after the operation, the patient continued in a very good way: the belly was soft and smooth; the wound looked very fair; the urine, pulse, and respiration, were good; there was no fever, the sleep was quiet. The matter evacuated was for thirteen days copious, but without smell; afterwards serous, and in small quantity, but having a strong smell and staining the probe with a black colour. But it was thought that this was rather to be ascribed to heterogeneous bodies corrupted, than to a mortification of the bowels, as there was no fever; and also because

\* Philosophical Transactions, Vol. XXXII. n<sup>o</sup> 370. sect. 4. p. 17.



cause, an antiseptic decoction being injected into the abdomen, there came out a skin of a broken hydatid, which seemed to have been at least as big as a hen's egg when it was whole.

What was the event of the disease is not said. But it is likely it was fatal at last; as putrefaction, which is so dangerous, was begun already; and the account subjoins, "appetite and strength now begin to fail." Certainly, when the abdominal viscera are soaked in putrid matter, and a robust man's strength begins to fail, little hope seems to remain.

Ought not therefore the wound to have been dilated in such a case? Certainly in the case under my care, I was not allowed to do this, yet the patient died in three days. In both the cases just recited, when the wound was dilated the patients found themselves relieved, and survived a longer time; and it is a general axiom, that desperate diseases warrant desperate remedies. The antiseptic virtue of the Peruvian bark, now so well known, would give us some room to hope a good issue, from injecting the decoction of it into the abdomen, and at the same time swallowing the same remedy.

Now the injection of detergent antiseptic liquids into the cavity, after the water is drawn out, has frequently been tried. For it has been observed, that the waters often deposited a feculent, muddy sediment, and that sometimes a gelatinous matter settles at the bottom; whence it is thought, not without reason, that in an ascites of long duration, something like this may happen in the cavity itself where the water lodges. Now these dregs may adhere to the sides of the cavity, and to the contained viscera, and seem likely to putrefy sooner than when air has been admitted; whence it has been thought adviseable to wash off these feculencies.

As after repeated tappings the liquor comes out thicker and fetid, Littre <sup>y</sup> used vulnerary injections in an ascites which occupied the duplicature of the peritonæum: and injections into the cavity of the ab-

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domen itself have also been tried, and that in large quantities. A skilful surgeon (Mr Warrick), equally ingenious and dexterous<sup>z</sup>, performing this operation on a woman of fifty who had an ascites, drew out thirty-six pints of transparent, greenish lymph, very successfully indeed; but in forty days more, the abdomen was swelled as much as ever. Hence there was a necessity for evacuating the waters anew: and as by various experiments on the water drawn out by the first tapping, he found that this liquid coagulated by mixing red wine, or Bristol water, with it, he imagined a relapse might be prevented, if these liquors were injected into the cavity after the water was drawn out. Two physicians of note consenting to try this method, when he had drawn out about two thirds of the water, he injected an equal quantity of Bristol water made blood warm, and of wine. As the abdomen could not be filled very fast, the patient began to faint; but recovered, when the abdomen was swelled again. The patient felt, she thought, as if the injected liquor entered her stomach: but as there was still a considerable quantity of lymph remaining in the abdomen when he injected the mixture of wine and Bristol water, he feared lest the efficacy of the mixture might be weakened: wherefore, letting out through the pipe all the liquid contained in the abdomen he filled the cavity again with a mixture, two parts wine and a third Bristol water, that the efficacy might be the greater. The patient then felt pungent pains in her breast, and twinges all over her bowels; she breathed with difficulty, the pulse fluttered, the syncope returned, and she was speechless: so that, evacuating the abdomen as soon as possible, he took out the pipe, and braced the abdomen with the usual dressings and rollers; and thus the patient recovered her senses.

The success was complete, for she had no relapse; but enjoyed perfect health.

The reverend Dr Hales hearing of this, formed a  
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<sup>z</sup> Philosophical Transactions, Vol. XLIII. n<sup>o</sup> 472. sect. iii. p. 13. et seq.

more commodious method of trying this experiment for the future, namely, by making a double puncture; so that while the water issues out by one pipe, the medicated injection may be thrown in by the other<sup>a</sup>.

From all that has been said, it appears how great an improvement in the art it is to let the waters out all at once, supporting and bracing up the abdomen at the same time.

Sometimes some things happen during the operation, which retard the flowing of the water; and, unless these obstacles can be removed, totally obstruct the evacuation. We have already spoken of the gelatinous viscosity of the contained liquid; but it sometimes also happens, that after a considerable quantity of water has been drawn off, and the abdomen has been constricted in proportion as the water has been evacuated, the omentum, or the intestines, touch on the orifice of the pipe and stop it up. Wherefore good surgeons take care to have in readiness a flexible, blunt, leaden probe, which they introduce through the pipe; and thus, without danger of hurting any part, they remove such obstacles. Such a probe must be of a smaller diameter than the hollow of the pipe, that it may be the more easily introduced, and that the water may pass out between it and the concave surface of the pipe. It sometimes happens, that membranes floating on the water get into the pipe and stop it up. A surprising instance to this purpose is related<sup>b</sup> of a case, wherein after the puncture was made no water came out; and on drawing out the pipe there followed a round body, somewhat flat however, prominent two fingers breadth from the wound: this being carefully drawn out without pain, or hæmorrhage ensuing, the waters rushed out with violence. This body being unfolded resembled a membrane as thin as a cobweb, in which nothing organical appeared; and hence it was thought to be the tegument of the cyst, which contained the water in its cavity. Whence also it was hoped, that the waters would not collect

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<sup>a</sup> Ibid. sect. iv. p. 20. <sup>b</sup> Acad. des Sciences, l'an 1718. Hist. p. 34.



so easily for the future; and it being found necessary to repeat the tapping twice in the space of two months, a less quantity was drawn out each time. The patient survived seventy-three days. Morand<sup>c</sup> found, on opening the body, the remainder of the membrane of the cyst adhering to the external membrane of the schirrhous liver, and pendulous from it.

But such bags have not always so thin a membrane, but more frequently are of a firmer structure, and sometimes have been found schirrhous, as appears from what has been said before. Sometimes they adhere to the intestines; and if they are not grown quite hard, but still have a contractile power after the waters are discharged, they may be capable of twitching and irritating the intestines: and the same thing may happen when the intestines, adhering to the bag, and no longer confined by the water which filled the cavity, act more freely; from which causes may arise those pains, and spasms, which sometimes follow the operation<sup>d</sup>.

After the waters have been as completely evacuated as possible, there might seem to be room for hope, that the little which remained might be absorbed, especially as by means of the belt the abdomen resists distension, and the physicians, by proper diet and corroborating remedies (of which hereafter, at §. 1250.) endeavour to prevent the return of the dropsy. And this resorption seemed so much more to be hoped, as medical observations shew, that even thicker fluids are capable of being resorbed, and afterwards evacuated by urine. A virgin of twenty years had had an ascites two years, and been tapt thrice: three or four pints of slimy bluish matter came out each time. After the third tapping, she began to use a ptisan of nettles, orrice, and round-leaved sorrel. The next day a like slimy matter was found in the urine, and in so great a quantity as to compose at least half the urine. She recovered, was married, and bore children<sup>e</sup>.

From what has been said we see, that an ascites fre-

<sup>c</sup> Ibid. Pan. 1719.

<sup>d</sup> De Haen Rat. Med. Tom. IV. p. 108.

<sup>e</sup> Acad. des Sciences, Pan 1703. Mem. p. 175.

frequently returns, and is rarely cured by a single tapping. This physicians could wish to be otherwise: but they are not surpris'd at it; well knowing, that, after the water is evacuated, the cause of the dropsy is not always removed, which remaining, a relapse is to be apprehended. They easily understand, that these vessels, which being dilated or burst let out their fluid, now freed from the pressure of the water, will pour out a like humour, and indeed in a greater quantity: whence they did not think it strange, that the abdomen, which had swelled slowly for several months, or even years, before the operation, filled very soon again after the load of water was discharged by tapping. But this has seem'd very strange indeed, that altho' a very small quantity of liquor was drank, and the urine equalled or even surpass'd that quantity; yet the abdomen in a few weeks was equally, and sometimes more swelled than before.

A woman, in an ascites, had forty-six pints of water taken from her by tapping, and was greatly relieved. Celsus has told us, (as mentioned before), "That it is  
" not improper to measure the patient's drink and his  
" urine; for if more moisture is discharged than is taken, in such a case there is hope of recovery." I followed this advice, and saw with pleasure that the urine daily exceeded in quantity the liquor drank; yet the patient being weigh'd every day, was found to grow heavier. In three weeks a new tapping was necessary, by which fifty-three pints were taken away: a month after, forty pints more were let out. During all this time she either wholly abstained from drink; or when she could bear extreme thirst no longer, drank ten ounces at most of beer, and that very strong. And as this woman was extremely desirous to recover, and I had always found her very obedient to my directions in other diseases, I had no suspicion that she deceived me: add to this, that she was poor, and had not meat or drink but such as I supplied. Now although, by a careful daily examination, the urine was found to exceed the quantity of drink, and of the liquid part of  
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her food, yet the size of the abdomen daily increased from the collected water.

Do therefore the bodies of dropfical persons attract water from the air? Hippocrates seems to be of this opinion; for he thought, that dropfies took rise from flatulencies: *But if flatus getting through the flesh have rarefied the pores of the body, moisture follows them, to which air has prepared the way<sup>g</sup>.* And to explain why the dropsy returned so soon, he says, *And this is another sign of this thing; for after the belly has been quite emptied, three days do not pass before it is filled again. What else but air can fill it? or what else can fill it so soon? For neither has such a quantity of liquor been drank, nor can the wasting away of the flesh be the cause, as the bones and sinews and the fibres still remain, from none of which such an increase of the swelling can proceed<sup>h</sup>.* It is certain, that in the warm summer air, which all think the driest, there lodges an incredible quantity of water: for fixed alkaline salts, produced by means of fire quite dry, grow moist presently in this air, and increase in weight as soon as they are cold; nor is it a small quantity of water which these salts attract to themselves from the air. Digby observed, that a pound of salt of tartar drew to itself from the neighbouring air six pints of water, when it was dissolved *per deliquium*, as the chymists speak<sup>i</sup>. If now we reflect on the lightness of the ambient air, we shall find, that this dry alkaline salt must have attracted the water from the air from a great distance; or the air being in perpetual motion, having various parts successively applied to the alkaline salt, must have deposited its contained water therein. Nor is this is a pro-

<sup>g</sup> Quod si flatus per carnes perrumpentes, corporis meatus rarefecerint, eos humiditas consequitur, cui viam aer antea struxit. *De Flatibus, exp. 6. Charter. Tom. VI. p. 218.*

<sup>h</sup> Est et hoc aliud ejus rei indicium. Nam ventre penitus evacuato, non transeunt tres dies, et iterum impletur. Quidnam igitur aliud quam spiritus impleat? quidve aliud tam cito implere posset? Neque enim tanta potus copia corpus ingressa est, neque carnes quæ collequescent in causa esse possunt, quum ossa supersint, et nervi, et fibræ, a quarum nulla quidem tantum aquæ augmentum fieri potest. *Ibid.*

<sup>i</sup> Dionis Dissertat. sur le tæzia, &c. ubi ille tractatus Digby habetur, p. 166, 167.



property of alkaline salts alone; but sea-salt also, and sal ammoniac, liquefy in the air: nay, that very strong acid oil of vitriol, if made by chemists as concentrated as possible, concretes into a solid form like ice, in clean glass vessels in which it is preserved, if they be close stopp'd up. If such a vessel be put in a scale, and an exactly equal weight in the other scale, let the stopper be taken out that the air may have free access, and scarce a minute passes before the scale in which the vessel is, descending, shews an increase of weight there; and therefore the solid mass of concreted oil of vitriol begins to liquefy. There are many other bodies which draw to themselves the water lodged in the air; but this is not the place to enumerate them.

What we have said already suffices to shew, that the air contains a considerable quantity of water, and that some bodies draw it thence and unite it to themselves.

If besides we consider, that, in an ascites, the tumid abdomen increases in bulk, while the rest of the body wastes and becomes exhausted of its juices; it will not appear unreasonable to believe, that dropical bodies attract to themselves the water from the air, especially as no other cause can be assigned, why persons in an ascites, after they have been freed from all the water by tapping, are so soon filled again, altho' they drink very little and eat the driest food, and although the quantity of urine even surpasses that of the liquor drank. A wonderful instance is related by Peter Servius, physician to pope Urban the VIII. of a nun, who, by fasting, vigils, and meditation, had so exhausted her body, that a violent heat came on, together with an extreme universal dryness. This nun, for some weeks, discharged every four and twenty hours upwards of two hundred pints of water from the bladder. Digby\* confesses, that he could scarce have believed this account, if so great a physician had not related it; and if he had not heard it confirmed by the patient herself, and by several physicians at Rome.

Often have physicians wondered to see the prodigi-

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ous quantity of limpid urine excreted in hysterical paroxysms, inasmuch that there might seem room to apprehend a dangerous inspissation of the blood, deprived of its diluting vehicle; yet such patients, when the fit is over, enjoy tolerable health. Does something similar happen in these diseases?

It remains to see the different prognostics formed by physicians, of the event after tapping, according to the different quality of the waters drawn out.

It was said at §. 1215. that a watery serum was collected in the larger and smaller cavities of the body in a dropsy; and it was then proved, that not always pure water is collected there, but there is almost always mixed with it some of the serum of the blood, diluted however with plenty of lymph, which does not coagulate over the fire like the serum, but evaporates. When, therefore, by tapping, a fluid is drawn off, which has the qualities both of lymph and serum, this is accounted a good sign, as it shews, that the extravasated fluids are in a healthy state, and not depraved by long stagnation or a beginning putrefaction; so that there is reason to hope, that the abdominal viscera, washed on all sides by this fluid, have not received much injury. Now the serum in healthy men is yellowish, has some lentor, is brackish, and exhales something of a urinous smell; whence the water of dropical persons is reckoned good, if it have the like qualities. This is well confirmed by the observations of Du Verney junior<sup>1</sup>, who found that a happy event was then principally to be hoped, when the water, discharged by tapping, was of a citron colour, and somewhat mucilaginous and brackish, and exhaled a urinous smell: and the more the water departed from these qualities, the greater he foresaw would be the danger; hence he condemned fetid water of a deep yellow, or of a red blood colour, as also those which were altogether mucilaginous, especially in women, because he observed, that then there was an encysted dropsy, which is seldom perfectly cured. Nay, he thought those dropical waters suspicious, which resembled pure wa-

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<sup>1</sup> Acad des Sciences, l'an 1703. Mem. p. 206, et seq.

ter, and after evaporation left little or no sediment; for in this case the patients generally died, the dropsy soon returning. If these waters deterge the fingers like some sharp leys, and wrinkle the skin, and make it more quick of feeling, this is a sign of considerable acrimony in them, and therefore that there is reason to fear the viscera begin to be corrupted, especially if shreds or torn pieces of the omentum come out together with the waters.

§. 1241. **I**F the circumstances enumerated at §. 1239, are wanting, or quite contrary, then tapping hastens the death of the patient.

Before at §. 1239. those conditions were enumerated, whose presence assures us, that tapping may be performed, not only with safety, but with good hopes of a cure. At the same time it was observed, that they seldom were all present; yet, that tapping might be useful, although some of these conditions should be wanting: but if all symptoms are contrary, as (suppose) that the patient is decrepit, the viscera corrupted, certain signs of putridity appear, it is then better to abstain from tapping, lest the physician should seem to have destroyed him whom he could not save. However, from what has been said hitherto, it appears, that tapping rarely if ever hastens death, if all the water be drawn out at once, the proper cautions being observed: for many true observations confirm, that dropical persons, of whose lives the most skilful physicians have despaired, have not only received signal relief, but have been perfectly cured by this operation; and even when there remained no hope that the cause of this disease could be removed, and therefore the return of the dropsy was certainly foreseen, yet tapping was of great service, by relieving the patient from intolerable uneasiness, and prolonging his life: from all which we may conclude, that tapping is useful; and that, according to the rules of our art, we ought to have recourse thereto in doubtful cases.



§. 1242. **D**RAINS made by the actual cautery by caustics, vesicatories, by the lancet, and by setons, in a fleshy but depending part, are often very serviceable, especially if the nature of the disease will admit of their being kept open.

If the collected water can by any way be drawn out from the body, this will ever be useful, as both relief is given to the patient by that means, and room is made for medicine to act in removing the cause itself of the dropsy. When the water is collected in the cavity of the abdomen, or of the thorax, it may be let out by tapping, as we have seen. But in an anasarca, when the water is lodged and distributed thro' the cellular membrane, of course we see that it cannot be let out by tapping: whence physicians have made use of a different method to procure an easy and safe discharge of the water collected under the skin. Nature herself has pointed out this method, and the event has often been fortunate; for it has sometimes happened, as has been mentioned, that the water has issued like a constant dew from the pores, and the dropfical swellings have gradually decreased. Sometimes the water penetrates through the skin, but does not pass through the epidermis, but raises it into blisters; and when these break, a perpetual dropping follows. Dropfical persons often put their legs, which are very cold, near the fire; and as the feeling is blunted in the swelled parts, a slight burn is occasioned, and bladders rise on the skin; which breaking of themselves, or being bruised, let out water constantly. In some places, women set their feet on portable stoves in the winter: if the feet and legs are swelled by a dropsy, such bladders generally rise on them; and I have seen many women relieved, and even cured by this means. Among many cures made by burning, Homberg<sup>a</sup> relates a case of a woman, whose thighs and legs were enormously swelled for many years, and the swelling was attend-

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<sup>a</sup> Ibid. Jan 1708. Hist. p. 56.

ed with pain, which she used to relieve by rubbing the swelled part by the fire, morning and evening, with spirit of wine: by chance the spirit took fire, and slightly burnt the parts, to which she applied some ointment, and in one night the swelling of her thighs and legs subsided entirely, all the water coming away by urine. It is true indeed, that in this instance no new issue was made, as the water suddenly set in motion, rarefied, and resorbed by means of this violence, was discharged by urine. However, it is scarce to be doubted, that this same water would have issued from the bladders raised by the burning, unless by being so suddenly resorbed it had found another passage: but the cure was complete, for the swelling never returned.

That an issue therefore may be made for discharging the water in an anasarca, the skin must be pierced so deep as that the wound may penetrate the cellular membrane; and at the same time the wound must not be so narrow as soon to close, or to be stopped up by the swelling of the cellular membrane. Physicians have tried various methods for this end. Hippocrates<sup>b</sup> directed, that in a boy the swelled parts should be opened with a lancet; and orders at the same time fomentations to be used, and the opening anointed with a warm liniment; for a gangrene easily attacks the flaccid parts after the water is drawn out, as we shall see hereafter. In another place<sup>c</sup>, treating of the dropsy, he says, *But if the swelling be in the scrotum, thighs, and legs, scarify with a very sharp lancet in many places, making the wounds very near each other.* Aëtius<sup>d</sup>, after he has enumerated many remedies for an anasarca, says, “But surgery is of more assistance in this kind of dropsy than all the aforesaid remedies:” And this he confirms by the authority of Archigenes and Asclepiades, who directed, “that the openings should be made about the inner ankle, four inches above it;”

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<sup>b</sup> De Locis in Homine, cap. 9. Charter. Tom. VII. p. 369.

<sup>c</sup> Quod si in scroto et femoribus ac tibiis tumor constitierit, per acuto scalpello multis et crebris vulnusculis scarificato. Hæc si feceris, cito sanum efficies. De Intern. Affect. cap. 23. Charter. Tom. p. 655.

<sup>d</sup> Serm. x. cap. 30. p. 246.

“ and that the incision should be as deep as is usually  
 “ made in bleeding.”

Nor did they fear that the wounds should inflame or close, as water perpetually oozed out, till the whole habit became slender. Forestus<sup>e</sup> caused the thighs and legs of a dropical woman to be beat twice a-day with twigs of holly; thus the skin being pricked or torn by the thorny leaves of this plant, the swelling of the legs and feet subsided wonderfully.

With much less trouble at this day the skin may be pierced with the instrument called a scarificator; where several lancets darting out at once, by means of a spring, make little wounds, from whence the blood is afterwards drawn by a cupping-glass. This instrument is so contrived, that the lancets will make punctures of different depths. In the present case, they must, after piercing through the skin, penetrate the cellular membrane, which may be done without any danger; and this membrane being distended with water, keeps the skin loose from the subjacent vessels and muscles; and as the skin is pierced in the twinkling of an eye, the patients feel no pain, and therefore are not afraid to undergo the operation again, if it be requisite to perform it on some other part.

A celebrated surgeon<sup>f</sup> was witness to an universal anasarca, in which all the parts of the body, from the crown of the head to the sole of the feet, were swelled. In vain were hydragogues and many other remedies given to this patient, who was both robust and young: the scrotum was so swelled, that he could not find convenient room for it between his thighs, in whatever posture he put himself. At last La Motte scarified the scrotum, thighs, and legs, in several places; from whence a vast quantity of water issued, with so good effect, that the swelling quite subsided in two or three days, and afterwards he quite recovered. A young peasant had an universal anasarca, which, together with an ascites, being neglected, grew to such a height, that no hopes of a cure seemed to remain. This unhappy

<sup>e</sup> Lib. xix. obs. 41. Tom. II. p. 394.  
 complet de Chirurg. Tom. II. p. 147.

<sup>f</sup> De la Motte Traite



happy man, in want of every thing, was however received into the hospital, that at least he might die quietly: the scrotum was prodigiously swelled, he had a difficulty of breathing, and such a debility of the vital functions, that the pulse could not be perceived in any part of his body, only a tremulous motion was felt about the region of the heart. Warm wine diluted with water being given him, so that he revived so far as that a very languid pulse was felt at his wrist, the lower part of the scrotum was pierced with a lancet in several places, bladders raised on his legs and feet were pierced, and a considerable quantity of water came out. The scrotum and legs were fomented with a warm aromatic decoction, and wine diluted with water was given him for his common drink, together with a diuretic julep: afterwards, the legs were pricked in several places, and an incredible quantity of water was let out; the swelling subsided all over the body, the appetite returned, the breathing and pulse grew better; the abdomen however was still swelled, but much less than before. He took every other day mercurial purges, and diuretic remedies in the intervals; with so good an effect, that in three weeks time this man was dismissed from the hospital in good health, of whom all had despaired before; and a year after, the physician who had had the care of him saw him stout and healthy &c.

Both these observations shew us, that we ought not hastily to despair, especially if the patients are in the flower of their age: for then when the load of water is removed, the strength soon returns; but this can hardly be expected when the patients are old.

Now as the cellular membrane is distributed all over the body, and its cells communicate with each other, it will not seem strange, that when this membrane is pierced in some lower part of the body, all the fluid which lodged in the cellular membrane should be evacuated: but it is more surprising, that the water in an ascites accompanying an anasarca,

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should.

should be let out by the same means. Aëtius<sup>b</sup>, as we observed before, commends incisions of the skin, as an excellent method for the cure of an anasarca; but he adds besides what follows: “ But thus Archigenes  
 “ expresses himself: They (says he) are not to be re-  
 “ garded, who say that by these punctures and inci-  
 “ sions nothing is evacuated: for we ourselves have  
 “ used this method of cutting the skin, and have dis-  
 “ charged great plenty of humours by these wounds;  
 “ infomuch, that the swellings of the thighs, and  
 “ legs, and upper belly, have evidently subsided and  
 “ shrunk.” Forestus<sup>i</sup>, in the passage mentioned above, relates, that when the legs and thighs of the woman who had an ascites, were beat twice a-day with prickly holly leaves, not only the swelling of these parts, but that of the belly also, subsided. Before, at §. 1215, it was noted, that the cellular membrane has a direct communication with the lymphatics: and practical observations shew, that the watery serum collected in the breast, is sometimes derived to the lower parts of the body, to the signal relief of the patients; as, on the other hand, it has frequently been remarked, that the breast is oppressed when dropfical swellings of the lower limbs suddenly disappear without spontaneous evacuations, or such as are procured by art: for the body, freed from the pressure of the water in the anasarca, seems to be so disposed, that the veins become capable of resorbing the water collected in the larger cavities, and that this water so resorbed may be expelled by those new issues made on the skin. Thus also it often happens, that when the water is let out from the abdomen by tapping, the anasarca of the lower limbs gradually disappears. Nay, sometimes also such sudden resorptions of the collected water have been observed. In an ascites, after about twenty pints of limpid water had been taken away by tapping, the belly swelled again in a few weeks; and when Dr Mead<sup>k</sup> and the surgeon came in the morning to tap the patient, he smiling shewed them

<sup>b</sup> Serm. x. cap. 30. p. 246. <sup>i</sup> Lib. xix. obs. 41. Tom. II. p. 394.  
<sup>k</sup> Monita et Præcepta Med. p. 154.

them his belly soft and lax, although there had been no uncommon discharge, either by stool, urine, or sweats. Some perhaps may suppose, that a tympany had succeeded to the ascites: but no mention is made of flatulles; and it is well known, that the ascites frequently returns after tapping: nor is it probable so experienced a practitioner as Dr Mead should have mistaken the case. This excellent physician has observed<sup>1</sup>, that by incisions of the skin of the legs, made so deep as to penetrate the cellular membrane, not only great relief, but sometimes a perfect cure of an ascites is obtained, an incredible quantity of moisture flowing out from the wounds for many days successively.

This he confirms by an instance of a lady of quality, near fifty years old, but of a tolerable robust habit, who laboured under an anasarca and an ascites both at once, so that little hope was left of life; and in this dubious situation a discharge of the humour, by an opening near the ankle, was proposed. The lady, although very unwilling, yet yielded at last to the intreaties of her friends, and suffered an incision to be made in each leg: for ten successive days, a gallon of water flowed out daily; and by the use of proper remedies she recovered, and her body returned to its pristine state. She lived five years in health, and then died of an acute disease. Dr Mead was of opinion, that this whole collection of water issued partly from the cellular membrane, and partly from the bag formed by the aponeurosis of the abdominal muscles and by the peritonæum, or by the distended double membrane of the peritonæum. But the resorption of the water from the cavity of the abdomen seems equally possible, as from such vast morbid cysts.

For making such issues in the skin, other methods also have been used; such as burning the skin very deep with a hot iron, which is termed the *actual cautery*, or corroding by the potential cautery, and so making a deep eschar, which being separated from the



living parts near it, by the suppuration formed all round, it gives a free course for the water collected in the adipose membrane to flow out. An ulcer thus formed, cannot so soon close as a slight fresh wound inflicted on the skin; wherefore such an issue keeps longer open. However, these methods of cauterizing are not much in use, because the patients are terrified at the thoughts of fire; and the eschar produced by the potential, as well as the actual cautery, cannot separate without an inflammation coming on first, and afterwards a suppuration all round it. Now as in these cases there is always some reason to fear a mortification, all possible care is taken to prevent an inflammation; and as the slight wounds made by scarification may be healed without any, or with a very gentle suppuration, this last method is generally preferred. Nor is the wound very easily closed while the dropping of the water continues; and if, on the discharge greatly abating, or quite ceasing, these little wounds should close before the water is all evacuated, new openings of the like kind may be made with little trouble. Rhazes directs an issue to be made in each leg, but at the same time gives this caution: "But do not open them by red hot iron, because fire dries and contracts the relaxed parts, so as to make it less pervious to the humours. Corroding or caustic preparations, besides the uncertainty there is how great a quantity of substance they will eat away, greatly weaken the part: from which cause many, and those irreparable injuries, ensue; namely, the festering and gangrene of the part<sup>m</sup>." And he affirms, that he cured a noble lady who had laboured under an ascites for two years, after many other remedies had been tried in vain, by opening two issues in her legs: "For after that, for the space of three months, a great quantity of serous humour had been discharged from these issues, the swelling of the belly subsided, the importunate thirst was abated, and at last by the use of a chalybeate wine diluted with a decoction of agrimony and rhubarb she recovered."

But

<sup>m</sup> Zacut. Lusitan. lib. ii. obs. n<sup>o</sup> 120, et 121. Tom. II. p. 401.

But as extraneous bodies must be put into these issues to keep them open, from the perpetual irritation of these sometimes the flesh all round is inflamed, which it is better to avoid. The same thing is true of setons, which have sometimes been used for the like purpose; for the thread left in the wound irritates in the same manner, especially if, as is not unusual, it is drawn out every day.

To answer the same end, vesicatories have been applied, by which the epidermis is raised into blisters full of lymph; which bursting, a perpetual dropping follows, continuing till the dropsy is exhausted; a great quantity of urine also being discharged at the same time. It is well known, that cantharides have the property of stimulating the urinary passages, and even sometimes occasion a troublesome strangury, if externally applied too largely. Perhaps vesicatories, large ones especially, are useful both ways. A celebrated physician<sup>a</sup> mixed 3 iij of cantharides with a sufficient quantity of leaven, adding thereto vinegar of squills, and applied this epithema to the thighs, for the cure of an anasarca, with good success, as appears from the two cases which he relates in the passage we have quoted. Sydenham indeed condemned the use of blisters<sup>o</sup>, fearing a mortification should be occasioned by them in the parts distended with water; but Tozzetti affirms, that he never saw any mortification happen in the parts where blisters were applied for the cure of an anasarca: he owns indeed that he feared this bad consequence, if they were used in a confirmed ascites.

But as all these issues (however made) must be kept open a long time, that the water may be totally evacuated, it is easy to see there will be more danger, if, together with the dropsy, there be also an acrimony of the humours. Thus for instance, before, at §. 1151, n<sup>o</sup> 4. among the very pernicious effects of the scurvy, the dropsy was enumerated as one. Now we know, that very bad ulcers, scarce surmountable by any remedies,

prey

<sup>a</sup> Targioni Tozzetti Osservaz. Medic. p. 109.  
Hydrope, p. 635.

<sup>o</sup> Tractat. de

prey on the legs of scorbutic persons frequently, from whence oozes a sharp fetid ichor in a scorbutic habit; therefore in such a habit there is some danger in making new issues in the lower limbs: but it must be confessed, that a dropsy is rarely cured, when it accompanies or follows a violent scurvy. But as in diseases in which, if left to themselves, certain death is foreseen, a doubtful remedy is better than none, perhaps this method ought not even then to be rejected; especially as so many experiments have established the antiseptic virtue of the Peruvian bark, by which there is great room to hope that a mortification may be prevented, or its progress stopped if it be already begun.

§. 1243. **A**S there are many instances of dropsies being cured by an evacuation of the waters by urine, we ought to attempt this method, when nature points out the way, by the use of urinous, fixed, and compound salts; by animal salts, vitriolated, and dissolved metals, which are specific in disorders of the kidneys.

It was observed before, at §. 1230. that making but little water, was one sign of an impending dropsy; whence, as we then said, Van Helmont placed the chief cause of the dropsy in the kidneys; and because he saw that dropfical persons made but little urine, and that of a high red colour, he says, “As, when there is a want of drink, nevertheless the kidneys still draw urine from the blood, though sparingly; so, in a dropsy, the urine is from the blood, not from drink, nor from water<sup>a</sup>.” And soon after he goes on as follows: “The kidneys therefore do not merely suffer the water to fall from them by its own weight; but they freely and actively send it from them, as they also  
“ draw

<sup>a</sup> In capitulo, *Ignotus hydrops*, p. 411. sect. 20. n<sup>o</sup> 4, 5, et 10. et p. 412. sect. 20. n<sup>o</sup> 19.



“ draw the same from all the blood of the veins ;  
 “ namely, when the dropfy is cured by a discharge of  
 “ urine.” Whence he concludes, that in the kid-  
 neys “ we must subdue the vitious obstinacy of the  
 “ archeus, so that a discharge of urine must follow,  
 “ if we would hope for health.”

But as the water abounding in the blood, after thin  
 watery drink for instance, or after perspiration is ob-  
 structed, is naturally secreted by the kidneys, and,  
 when secreted, expelled from the body ; the reason is  
 evident, why physicians have always thought of diu-  
 retics, which besides have this advantage over other  
 remedies, that they give less disturbance to the body  
 than vomits or purges, and do not weaken the patients  
 so much. Whence also Sydenham <sup>b</sup>, who placed the  
 principal hopes of cure in the use of emetics and strong  
 purges, yet was obliged to have recourse to diuretics,  
 for patients of weak constitutions, and for hysterical  
 women. He confesses, “ That by the use of these a-  
 “ lone he had seen desperate dropfical cases cured in  
 “ those persons whose weak habit would not bear  
 “ purges.”

Diuretics are very various <sup>c</sup> ; for water, and all wa-  
 tery liquors, to which may be referred those animal-  
 juices which are acescent, such as whey, butter-milk,  
 &c. if plentifully drank, increase the quantity of wa-  
 ter in the blood, and by this means promote the secre-  
 tion of water from the kidneys: but if in dropfical pa-  
 tients there should be a large quantity of water collect-  
 ed, and little is secreted by the kidneys, there is a dan-  
 ger that the watery swelling should increase, by drink-  
 ing plenty of watery liquors: for unless, when these  
 are taken, the vessels of the kidneys can be so relaxed  
 and disposed as to transmit freely what is taken in, the  
 disorder will increase, as the skin of dropfical persons  
 perspires but little; so that there is scarce any hope  
 that the cutaneous vessels should give a passage to the  
 water received into the body. On this account, phy-  
 sicians rather chuse to give such things as are diuretic  
 by some stimulus or some specific virtue. It is known,  
 how-

<sup>b</sup> Traſtat. de hydrope, p. 629.

<sup>c</sup> Boerh. Inſtit. ſect. 1222.

however, that medical or mineral waters drank in great plenty, if they can find a passage by the kidneys, sometimes cure desperate dropfical cafes: of which a surprizing instance was related before, at §. 1236. But it must be owned, after all, that the event is doubtful, as watery liquors taken plentifully, if they are not of service, are always injurious.

But as, in health, saline particles, which if they remained might be noxious, are also discharged by urine; hence physicians have thought, that the urinary discharge would be promoted by such things being taken as increased the necessity of it. It is certain, that salt things taken into a healthy body increase the secretion of the urine; and for this cause chiefly, that, thirst being excited by them, more liquor is drank, and therefore more urine is excreted: for unless more drink be taken when salt things are eaten, the urine may be rendered more acrid, and the bladder more frequently stimulated to discharge it; but it will not always be more copious, which is the principal thing required in the cure of a dropfy. Besides, it does not seem to be always safe to increase thirst, which is so troublesome to persons in a dropfy, by giving saline remedies, as there are few who have command enough over themselves to endure it; whence, from their drinking plentifully, the dropfy will increase. Hence acid salts, which are also accounted diuretics, are preferred by many, as they also appease the thirst, and efficaciously resist putrefaction.

We read, that drinking five or six ounces of vinegar was of service in the cure of an ascites<sup>d</sup>. Others have used alkaline salts; and these we may try with the less scruple, as Dr Pringle's experiments demonstrate, that alkali's do not so much promote putrefaction as was formerly believed.

But the most successful method has been, combining fixed alkaline salts with a vegetable acid, so as to produce a sort of tartarus regeneratus. Sydenham<sup>e</sup> found these preparations very efficacious, namely lixivial

<sup>d</sup> Combalusier Pneumato-pathol. p. 535.  
p. 629.

<sup>e</sup> Tractat. de hydrope.

vial salts infused in wine. Nor did he think it was of any importance from what species of vegetables they were taken: but as broom is easy to be had, and as this plant has ancient and medical tradition on its side, he ordered a cold infusion of a pound of the ashes of this plant in four pints of Rhenish wine, adding a pugil or two of common wormwood; then the liquor being strained off, he gave four ounces of it morning and evening, until all the swelling subsided: and he affirms, that he had seen this method succeed very well. As broom has a saltish juice, there is a considerable quantity of fixed salt left in its ashes. Many have recommended the ashes of bean-stalks; others, the ashes of other plants. If to the lixiviated fixed salt of these plants an acid wine be infused, in the proportion of two pints of wine to an ounce of salt, this makes a remedy adapted to this diuretic indication; and which possesses at the same time a powerful, dissolving, and deobstruent quality, and is of use both for removing the obstructions of the viscera, and attenuating the viscidities and lentor of the fluids; and therefore is of efficacy, not only to discharge the water, but to remove many causes of the dropsy.

Infusion of juniper-berries is also given, which is famous for its diuretic virtues; but it should be made with a great quantity of the berries, as the body easily bears this remedy, and is not thrown into violent commotions by it. Du Verney the younger<sup>f</sup> asserts, that wine medicated with the infusion of juniper-berries, to which were added the lesser centaury, and drank as common drink, was of signal service to a man in an ascites. I have often found, that a strong infusion of these berries sufficed for the cure of an ascites, and of an anasarca, when the disease was not quite inveterate.

In the shops is kept rob<sup>r</sup> of juniper-berries, whereof if four ounces be diluted with two pints of distilled juniper-water, and to this mixture be added two ounces of spirit distilled from juniper-berries, a remedy is composed, which concentrates in itself the whole power

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er of juniper-berries; to which sometimes is added half an ounce of dulcesied spirits of nitre, if the patients are very thirsty. If an ounce or two of this remedy be taken every three hours, it has usually a very good effect. Seed of ash also, infused in spirits of juniper-berries, and taken as the former medicine, is of service.

Many other plants are commended for their diuretic quality<sup>g</sup>, from which various remedies may be prepared to suit this indication. It has sometimes been known, that strong purges, given even in a large dose to dropical persons, have caused no stools, but have brought on a prodigious flow of urine. Thus we read<sup>h</sup>, that fifteen grains of diagridium, with as many of the mercurius dulcis, to which were added six grains of gum guttæ, being given to a dropical patient, caused no stools, but brought on a most plentiful discharge of urine. Mention was made before at §. 1237, n<sup>o</sup> 3. of administering purges, emetics, and other strong remedies, in so small a dose, or so corrected, as that they scarce have any sensible effect on the *primæ viæ*; and that then they often have a very considerable diuretic efficacy, and are therefore very useful for the purpose we are now considering. Thus it is observed, that the leaves of asarabacca, when they are given crude, or infused in water, purge the body upwards and downwards; and if they are boiled for an hour or two, act only by a diuretic efficacy<sup>i</sup>.

Many have commended the expressed juice of bruised millepedes in wine; and I have known it serviceable. Some have ventured to give cantharides; but terrible consequences sometimes follow this practice, which are excellently described by Dioscorides: so that, as there are other safe and sufficiently efficacious remedies, prudent physicians abstain from this.

The root of the sea-onion, or squills, seems to deserve the first rank. It is indeed disagreeable, by its extreme bitter taste, and because when given in a large

<sup>g</sup> Boerh. Instit. sect. 1222. n<sup>o</sup> 7.      <sup>h</sup> De Laiffe Recueil d'observ.  
de Chirurg. p. 179.      <sup>i</sup> Boerh. in loco modo citato.

large dose it excites a nausea and violent vomiting. This was a remedy in esteem with the ancient physicians, for the cure of many difficult diseases, especially when infused in wine or in vinegar: whence vinegar of squills, *vinum scilliticum*, *mel et oxymel scilliticum*, were much in use. However, the ancients seem to have feared the strength of this root, and therefore contrived various preparations to mitigate the violence of its operation. It is known, that the trochisci scillitici, which are an ingredient of the theriaca, are prepared from the bulb of the sea-onion, or squill, baked in an oven; and from the pulp of this root, to which flour is added, these troches are made.

Aëtius, enumerating those remedies which are drank by dropfical persons to excite a discharge of urine, says, they will find benefit, “if they drink every day vinegar of squills: for of the number of those remedies, which excite urine without molesting the body, are roasted squills made into a linctus with honey: or else take roasted squills, rub them, and mix the powder with an equal quantity by weight of flour of vetches; dry the powder, and give thereof 3j in wine<sup>k</sup>.” Celsus directs binding boiled squills over dropfical swellings; and for the cure of a leucophlegmatia, he says, “if the person be strong, boiled squills may be bound upon his belly at the same time<sup>l</sup>.” Cælius Aurelianus ordered a pound of well purified squills to be boiled, with three sextaries of wine (a sextarius is about a pint and a half,) to a third part: then of this wine he gave “two spoonfuls; and in the progress of the cure, we may rise to a tierce of an ounce. But this must be given after riding, or after anointing the body, and a considerable time before eating<sup>m</sup>.” Whence it appears, that the ancients used squills with very great caution only.

As I have always been of opinion, that the dose of such medicines, from which any bad consequences might be feared, was rather to be lessened, than that their efficacy should be blunted by operose methods of

<sup>k</sup> Serm. x. cap. 36. p. 240.<sup>l</sup> Lib. iii. cap. 21. p. 164.<sup>m</sup> De Morbis Chronic. lib. iii. cap. 8. p. 477.

preparation, I rather chuse to give the fresh and crude root: for although it be an exotic, yet it is capable of being preserved long fresh and full of juice: for I have frequently seen, to my wonder, the root of the squill preserved in boxes for many months, not only remaining entire, but to have vegetated. I order half an ounce of such a fresh root (only taking off the dry outward coats) to be infused in two pints of wine, and I give half an ounce of this *vinum scilliticum* to a grown person in the morning fasting. A slight nausea commonly follows without vomiting; and suddenly there comes on a plentiful flow of urine, insomuch that I have known six, eight, nay, twelve pints, excreted in the space of a few hours, to the great relief of the patient. The dose may be lessened or augmented, according to the different age and strength of the patient. For I was very solicitous to observe how great a dose was sufficient to occasion a slight nausea only, without a vomiting; for then I was sure the medicine would prove a diuretic: but if it made the patients vomit, so great a flow of urine did not follow; nor did it, if they had no nausea from the medicine.

This seems to be the reason why a celebrated author has given these cautions to prevent vomiting from the use of squills: “ If the infusion of squills be given  
 “ with cinnamon-water, it seldom excites vomiting;  
 “ but sometimes procures a plentiful evacuation by  
 “ stool, and sometimes by urine; and truly this is the  
 “ reason that it is held in so much esteem for the cure  
 “ of dropries<sup>n</sup>.”

The dose of this remedy differs much for different persons. I have seen some who could scarce take half an ounce without vomiting; and in others, thrice that quantity was requisite to excite a nausea.

The use of this wine is to be repeated every day till all the water is evacuated: but as the patients gradually become less and less affected by this remedy, it may be prudent to increase the dose, so as to render it efficacious. But although squills, and all preparations into which they enter, have a very considerable dissolving

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ving and attenuating power, yet they are not always sufficient alone to remove the cause of the dropsy; and there will frequently be occasion to use other remedies. We consider here only the evacuation of the water by urine, for promoting which this remedy has a signal efficacy. But it is evident that this remedy can be supposed of use only when the cavity, in which the waters are lodged, is so disposed as to be capable of resorbing them; otherwise they could not be discharged by urine. But the patients are less weakened by the use of squills than by strong purges; and I generally make trial of this remedy, before tapping is attempted.

§. 1244. **V**OMITS dissolve all viscidities, agitate the obstructed vessels, and expel the stagnant fluids; whence they are of wonderful utility in this disease.

Before, at §. 1237. we mentioned the use and efficacy of emetics in the dropsy, when given in so diminished a dose as to excite only a slight nausea, and rather to act by stools or urine. But we come now to treat of the effect of vomits, not as they evacuate the water; but rather as, by the violent concussion which attends vomiting, the collected waters are so moved and shaken, as to become capable of being first resorbed, and afterwards expelled by various passages from the body. Before, when we treated of vomiting as a febrile symptom, at §. 652. mention was made of that convulsive motion of the muscular fibres, of the fauces, œsophagus, intestines, diaphragm, and abdominal muscles, which happen during vomiting. At the same time we observed, that by vomiting, not only all the contents of the stomach and intestines were expelled, but also the humours which pass from the other abdominal viscera into the stomach and intestines: it appears from hence, how extensive is the efficacy of emetics. But we have already seen, that obstructions in the viscera are among the causes of a dropsy; and that sometimes the water lodged in the

cavity of the abdomen grows viscid, nay, is changed into a tremulous jelly, which can be rendered fluid again, and by that means more disposed to be reformed. Now, by the same concussions, obstructions of the viscera may be opened, if they are not already grown to a schirrhous hardness. Wherefore we see, that skilful physicians had good reason to place great hope in the use of emetics for the cure of dropsies of other kinds, as well as an ascites; and that, as Aëtius said, “vomits are of great use in an anasarca<sup>a</sup> :” and he would have them tried even on children in an anasarca, although it was difficult to gain their consent; wherefore he directs that the tonsils should be tickled with feathers, or with the fingers, dipt in oil, to provoke vomiting; and he mentions many other artifices to the same end. For the whole body is shaken in vomiting, and almost all the muscles are put in agitation. But although it does not seem that a discharge of the waters should follow presently after vomiting, but only that the water should be so diffused by the effect of the concussion of the muscles as to be more readily reformed; yet Sydenham<sup>b</sup> observes, that after vomiting has ceased, purging usually comes on, which evacuates the waters reformed by means of the concussion of the muscles in vomiting; nay, he observed, that, after repeated emetics, the waters were discharged both upwards and downwards<sup>c</sup>. At the same time he tells us, that if the swelling of the abdomen in an ascites be but inconsiderable, the waters are not so readily evacuated by vomits, as when the belly swells with a greater quantity of water; for “the very mass of waters itself, when it is shaken and  
 “agitated by the operation of the emetics, contri-  
 “butes wonderfully to their evacuation; and on this  
 “account, unless the belly be considerably swelled,  
 “this whole affair is best left to remedies evacuating  
 “downwards.” For it is easy to conceive, that the kind of press formed by the abdominal muscles and diaphragm acting in conjunction, has more force on  
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<sup>a</sup> Serm. x. cap. 31. p. 247.

<sup>b</sup> Traçtat. de Hydrope, p. 617.

<sup>c</sup> Ibid. p. 625.

the contained waters, if the abdomen be greatly distended with them.

§. 1245. **B**UT they must be strong, frequently repeated, and at short intervals.

This was Sydenham's method <sup>a</sup>, which he boldly pursued. For he gave a very poor woman, who was more than fifty years old, and after a long intermitting fever had been in prison three years, had suffered greatly from cold, and whose abdomen had swelled with an ascites to such a degree, that he owns he never saw a dropical swelling of equal size; to this woman, I say, he gave a strong antimonial emetic, namely, an ounce and an half of the infusion of *crocus metallorum* for three successive days, and afterwards every other day till she had taken six doses of this emetic. The swelling of the abdomen indeed grew less after taking three doses, and the patient was greatly relieved; but the body was at the same time thrown into such strong commotions by the violent operation of the remedy, that he did not think it safe to persist in the use of the emetics, but was obliged to finish the cure by the repeated use of purges; and these he was frequently forced to omit for a time, as hysterics followed the use of cathartics, although not to such a degree as from the emetics. Such a method of cure has this inconvenience, that there is need of powerful remedies, which must be frequently repeated, and at short distances of time, as otherwise the patients begin to swell again. But certainly, that the habit may be able to bear such violent agitations, the viscera ought to be sound, and the strength tolerably firm.

It is to be noted besides, that after so many evacuations, the cure of the dropsy is not complete, as the physician cannot be certain that the cause is removed; he has only let out the water effused into the cavities. A third condition still remains, to render the cure perfect, (see §. 1231.) namely, that the disorder of the debilitated viscera be removed, whether



this has been the cause or the effect of the dropsy. If now we consider how great a strain is put on the viscera by the repeated use of strong remedies, will it not be safer to discharge the waters from the cavity and thorax of the abdomen by tapping; or, in an anasarca, to make issues in the depending parts of the body, by which the water collected all over the habit may ooze forth? That these methods are safe, appears from what has been said before; and there seems scarcely any doubt, but that they may be followed with less trouble and danger to the patient, than attends the use of violent emetics or cathartics.

§. 1246. **T**HESE emetics generally prove brisk purges also, so that they are useful two ways; and often also a third, namely, by promoting a discharge of urine.

The virtues of emetics and cathartics have so great an affinity, that emetics almost always purge; and purges, of the stronger sort especially, excite vomiting when they begin to act. Sydenham therefore recommended infusion of *crocus metallorum*, of which he gave an ounce and an half; and, to such as were hard to purge, two ounces; “because, when the vomiting ceased, it used to operate by purging downwards<sup>a</sup>.” Nay, if a copious purging did not follow, he added to this infusion, syrup of buckthorn and *electuarium de succo rosarum*. Hoffman<sup>b</sup> found, that emetics given for a dropsy, in a dose a little larger than usual, repelled the watery serum downwards, and more seldom upwards: and in another place he relates a happy cure which he had wrought, by adding ipecacuanha to purges; the effect whereof was, that not only the belly was sufficiently purged, “but a prodigious quantity also of a watery fluid was discharged from the womb.” The excretion of the urine is likewise frequently increased, when the extravasated serum begins to be resorbed in consequence

<sup>a</sup> Ibid. p. 617, 618.  
cap. 5. p. 483.

<sup>b</sup> Med. Rat. System. Tom. III. sect. 3.

quence of the concussions occasioned by vomiting; and this fluid afterwards issues from the body by various passages, if the cure proceed happily.

§. 1247. **T**HE discharge of serum by stool, is procured by strong purges, taken in various forms, but chiefly in a liquid, and frequently repeated at short intervals.

Physicians have placed great confidence in the use of purges for the cure of a dropsy; and they have been the more induced to this, as nature often indicates this method of recovery. Hippocrates has said (as we took notice formerly at § 423, no 2. and §. 720.) “When the water in dropical persons, passing through the veins, goes off by stools, they recover<sup>a</sup>”: and elsewhere; “A watery diarrhœa not crude, coming in the beginning of a dropsy, cures the disease<sup>b</sup>.” In another passage he speaks well of a brisk purging downwards: “When any one is inclined to a dropsy, and has a disorder of the spleen, or is afflicted with a leucophlegmatia, it is good for them to have a violent diarrhœa<sup>c</sup>.” In another place<sup>d</sup>, where, under the title of a leucophlegmatia, he describes an universal anasarca, he says, “If a spontaneous diarrhœa come on in the beginning of the disease, then the patient probably will recover;” and then he adds, “But if there be no such diarrhœa, let a cathartic be given.” Elsewhere<sup>e</sup>, treating of the same disease in a more advanced state, he says; “If there be no spontaneous diarrhœa, then we should purge with cneorum, or teasle, or grain of cnidium, or magnesian stone.” Hence it appears, that Hippocrates expected much benefit from a purging, when nature brought it on in a recent dropsy; and that, where this failed, he endeavoured to promote it by art, and that by sufficiently acrid

<sup>a</sup> Coac. Prænot. no 461. Charter. Tom. VIII. p. 879.

<sup>b</sup> Ibid.

no 457. ibid. p. 873.

<sup>c</sup> De Morb. lib. i. cap. 4. Charter.

Tom. VII. p. 535. et Aphor. 29. sect. 7. Charter. Tom. IV. p. 305.

<sup>d</sup> Ibid. lib. ii. cap. 28. Charter. Tom. VII. p. 579.

<sup>e</sup> De Intern.

Affect. cap. 22. ibid. p. 654.

acrid medicines, and even when the disease was not in its beginning. But we are to note, that the patient's strength was entire when Hippocrates tried this method; for he orders, "the next day, to let him walk twenty furlongs. On his return, let him eat a little toasted bread, and with it boiled garlick, and drink a little strong wine undiluted. Then let him walk thirty furlongs; and at a proper hour, eat as much at supper as he used to do at dinner. His victuals should chiefly be pigs feet or heads, or else fowls or pork minced. Of fish, he should take the scorpion, the quaviver, the cuculus, the calionymus, the gudgeon, and such other fish as have the like qualities with these. Of vegetables, he should use none except garlic; of which he should eat much, both raw, roasted, and boiled, increasing the quantity every day; and increasing also exercise and fatigue, in proportion to the quantity of his food."

From which it is evident, that Hippocrates used purging in the cure of a dropsy when recent; and even when of long standing, in such patients whose viscera had still firmness enough left to digest strong food twice a-day, and strength sufficient to bear motion and fatigue. Nor does he appear to have attempted the cure by this method when the disease had lasted a very long time; for he adds, "It is determined in thirty days, whether it will be mortal or not." Nor does the dropsy, for which he advises cathartics, take rise from a cause so little surmountable as schirrhuses of the viscera; for he says, "This disorder generally comes on in summer, from drinking water, as also from immoderate sleep."

Nor does he seem to have expected much good from purges, if the patients were much swelled with the dropsy; for he says<sup>f</sup>, "If you attend the patient in the beginning of the disease, before he is much swelled by an exuberance of water, administer remedies to purge the water and bile downward. But bile is not to be moved:" For in dropical persons, the

<sup>f</sup> Ibid. cap. 6. p. 626.



the bile is frequently deficient both in quantity and quality; and those in whom the bile is copious and acrid, are less inclined to this disease. Certainly, if the conditions of §. 1239. are present, cathartics often complete the cure. Among many instances to this purpose, I remember one, in which I cured a man of an universal anasarca and ascites both, with two doses of a purgative remedy. I gave him two ounces of jalap-root with four grains of turbith-mineral at a dose, with so good effect, that the swelling totally subsided, and he perfectly recovered. But he was no more than thirty years old, robust, always healthy before, and had fallen into a dropsy merely from drinking a great quantity of small beer in hot weather on ship-board, and had gone to sleep with his body not well covered, and the air had cooled suddenly while he slept, by a storm of thunder. But so good success is not to be expected when the disease has grown old, and the causes are more obstinate.

It is observed, that dropical persons, especially when the disease has got to its height, are scarcely moved but by strong purges; and even of these, if they are to be repeated, the dose must be increased, or some more stimulating ingredient used. If we run over the list of hydragogues, we shall find they are all very strong purges, and which also possess a power of dissolving the crasis of the blood into a thin and putrescent fluid, and expelling it so as to be dissolved by stool: for when the cure of a gonorrhœa, or other venereal complaint, is attempted by frequent purges, we see plainly the texture of the blood is dissolved, the lips, eyes, and gums grow pale, and the whole body loses its plumpness. Now, in an old ascites, the emaciation is so much the more considerable as the swelling of the abdomen is greater, (see §. 1230.) If, therefore, by hydragogue purges, the little blood which still circulates through the large vessels be all attenuated, and its crasis broken down, there is a danger lest the patient's strength be exhausted by the operation of these remedies, unless the water, being suddenly resorbed from the abdomen, should be discharged by stools

stools, and thus room be made for corroborating remedies and a restorative diet. Is it not clear therefore, that the water may be more speedily and more safely discharged by tapping? If we recapitulate the remedies mentioned in the *Materia Medica* of our author, under this aphorism, and at §. 1245. we find there, turbith mineral, the fresh expressed juice of the middle bark of elder, leaves of bind-weed, elaterium, or the inspissated juice of wild cucumber, jalap, scammony, and Boyle's luna purgative, called also the hydragogue of Angelo Sala <sup>g</sup>.

From what we have already observed it appears, that Hippocrates used tolerably acrid remedies. Nay, Celsus <sup>h</sup>, who has said that "it is better to move the belly by food than by physic;" yet advises, for the cure of a dropsy, (among other less powerful remedies), if necessary, to give "orrice, nard, &c. with flavesacre," which is certainly very sharp: but he adds, "that the mildest of these must be tried first, that is, the rose-leaves or spikenard." Nor does he seem to have much approved of the frequent use of purges at short intervals; for he says afterwards, "Thus far general rules may be laid down for all the species of the distemper; if the malady rises to a greater height, different methods of cure are required, according to the different degree of the disease."

However, Sydenham <sup>i</sup> and many others affirm, that they have found, that, when the expulsion of the water was attempted by purging, the cure did not succeed if long intervals were left between the purges. Whence they were not willing to leave off the use of these remedies, if the patient could support them till the whole mass of the waters was evacuated. "However copious a purging has preceded, we shall give opportunities for the water to collect again; and by allowing them this truce, we, like them who know not how to use a victory gained, shall lose our ground, and be repulsed with disgrace." But he would have us carefully inquire, whether the patient is easily

<sup>g</sup> Boerh. Chem. Tom. II. p. 468.

<sup>h</sup> Lib. iii. cap. 21. p. 162.

<sup>i</sup> Traſtat. de Hydropc, p. 613, 614.



ly purged, as men are very different in this respect; and sometimes very robust men are moved with gentle purges, and on the other hand persons of weak constitutions need stronger physic: but he preferred, on the whole, strong purges; nor did he fear a hypercatharsis, as he could so easily stop the purging by liquid laudanum.

Sometimes, also, purges act as diuretics; but seldom operate by stool, urine, and sweat, at once. *Seneka*, or *Polygala Virginiana*, has been known to have this effect. An ounce of this root was boiled in a pint of water to half the quantity, and three spoonfuls of the straining were given to a man labouring under an universal ascites and an anasarca; there was a fever at the same time: however, the success was good, altho' the spleen was swelled and hard; for the dropical swelling subsided, and the fever was removed<sup>k</sup>.

A liquid form is preferred for purges, because the primæ viæ are often dry, so that pills and other viscid remedies will scarce dissolve, and hence their action will be blunted.

§. 1248. **T**HE waters are dissipated by the heat of a fire, or of a stove, oven, sand, the sun, salt, or dung; for by these means a diaphoresis, or sweat, is excited.

As daily observation evinces, that moist bodies in dry and warm air grow gradually dry, the moisture being dissipated in time; hence this has been attempted on dropical bodies, with the hope that some part of the superfluous moisture might be dissipated daily. But the air which dries moist bodies surrounds them on every side, whereas the water of a dropsy lodges in the cavities of the body; or if it be dispersed through the cellular membrane, the skin surrounds it, which will hinder its dissipation. Aretæus<sup>a</sup>, treating of the dropsy following diseases of the liver, has said, that the

<sup>k</sup> Acad. des Sciences, l'an 1744. Mem. p. 55.  
Signis Morbor. Diuturnor, cap. 13. p. 43.

<sup>a</sup> De Causis e



the safest cure of all is, if the sweat, flowing abundantly, removes the disease; but he observes, that it is not usual for dropfical persons to have much moisture upon the skin. Whence it is evident, much good cannot be expected from this attempt to dry the dropfy by a dry warm air.

But it should seem, that an increase of warmth may be serviceable in another way to dropfical persons. We have often observed already, that a moisture exhales from the arteries, in the form of a steam, into the cavities of the body; and is resorbed in the same form by the veins, before it condenses into a watery fluid: whence, in healthy animals opened alive, all the contents of the abdomen and thorax are found moist, but no collected fluid appears, only a moist vapour with something of an urinous smell exhales. As, now, the legs and thighs of dropfical persons are manifestly cold, nothing is here resolved into a vapour, nothing therefore is resorbed, but the watery fluid is accumulated more and more, which the extremities of the arteries persist to effuse. If, therefore, art applies an unusual heat, so that some part of the collected water dissolves into a steam, this will be resorbed, and the swelling will decrease. This was evidently shewn by the case related at §. 1242. wherein, by a fortuitous burning of spirits of wine, an anasarca of the legs and thighs, which had lasted many years, subsided; so that the whole swelling vanished in one night, and never returned, the whole mass of water being evacuated by urine: for when once the water is resorbed from the places where it has stagnated, it easily finds a passage for its discharge from the body.

Every one knows, that, by frictions, first the parts to which it is immediately applied, and afterwards the whole body grows warm. The ancients made great use of them<sup>b</sup>; but they used those of the softer kind, lest the skin, stretched by the dropfy, should be injured. At the same time they exposed the swelled part to the sun; “but not too much, lest it light up a fever: if the sun is too powerful, the head must be

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<sup>b</sup> Celsus, lib. iii. cap. 21. p. 164.

“ covered, and friction must be used.” They endeavoured by all means to excite warmth on the skin<sup>c</sup>, by walking, running, or frictions, which weakness will not sometimes admit: “ Sweat is also to be procured, “ not only by exercise, but also by hot sand, or the “ laconium or clibanum (a kind of stoves) and such “ like means; and natural and dry sweating-places “ are very beneficial, such as we have at Baiaë, among “ the groves of myrtle. The bath and all moisture “ is hurtful.” The ancients therefore approved of a dry heat; and to this day, journeys to Portugal, Spain, and Naples, are advised to patients in this disorder.

Hippocrates<sup>d</sup> says, that a person in a dropsy should endure fatigue, and should sweat; but if the patient’s strength is not equal to such exercise as will excite warmth, then external heat should be employed to supply the defect. I ordered hot bricks to be applied to the abdomen of a patient in an ascites, not without success; but the swelling of the abdomen was not very considerable. Physicians have employed various methods to warm the skin, and to give motion to the stagnating fluid, to the intent chiefly of dispersing the water by sweat. Schenke<sup>e</sup> advised men of small fortunes, “ that they lie down with their whole body on “ a table in an oven, immediately after the bread was “ drawn out, in such a manner however, as to have “ the head leaning on a pillow without the mouth of “ the oven, to leave the breath free, lest the heat “ should suffocate.” He also advised a vapour-bath, as hot as the patient could bear it; but as a vapour-bath will relax the parts, already overstretched by the water, this perhaps would not be proper. If any thing of this kind were to be tried, perhaps the steam of spirits of wine set on fire would be preferable, if directed immediately to the dropical part; a particular method of doing which was mentioned at §. 529. in treating of the cure of the diseases of the bones.

As dung has a warmth nearly the same with that of the human body, this, as we read, has also been em-

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employed

<sup>c</sup> Ibid. p. 162.  
p. 347.

<sup>d</sup> Epidem. lib. v. textu 41. Charter. Tom. IX.  
<sup>e</sup> Lib. iii. p. 442.

ployed for the cure of a dropsy. Thus Heraclitus, when from misanthropy he had retired into the mountains, he living there on pot-herbs and other vegetables, fell into a dropsy; and shutting himself up in a stall of oxen, and wrapping his body in their dung, he found out a cure by this method. Hermippus relates, that he exposed himself to the rays of the sun, and ordered some boys to smear him over with ox's dung; but that he died the next day. Another has related, that, sticking in the dung, he was torn by dogs. According to others, he was cured of the dropsy, but afterwards died of another disease<sup>f</sup>. Whatever were the event, it is certain the method was attempted. The warmth of dung is easily enough borne by the body; for it is asserted, that hens eggs may be hatched by this means: and I know a very learned man who is now alive, who in his childhood, being very poor, got safe through the small-pox, having no covering but dung to keep off the extreme cold of the winter of the year 1709, which was so severe over all Europe.

An attempt has also been made to disperse dropfical swellings, by applying sea-salt decrepitated, perfectly dry and warm, wrapped in a linen cloth. This remedy is serviceable, not by the heat alone, but as salt draws water to itself from the air, although it appear very dry: hence a hope has been entertained, that it might unite the water in an anasarca to itself, and thus diminish dropfical swellings. Nor is this method without success; if the application be frequently renewed, partly that a more speedy effect may be obtained, partly lest the salt, melting into a brine if kept long on the part, should corrode or inflame the distended skin, and occasion ulcers difficult of cure.

At the same time it appears also, that perspiration and sweat are then only useful when the stagnating water begins to be reformed; or when there is hope, that, by the application of external warmth of the fire, the sun, hot sand, &c. it may be disposed for reformation, for then sweat usually follows; but if, when the belly is prodigiously swelled in an ascites, warm

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<sup>f</sup> Diogen. Laert. lib. ix. cap. i. p. 964, et seq.



stimulating sudorifics should be given, these would not act upon the extravasated stagnating water, but would only expel from the body that little remaining fluid which still circulates through the vessels, and supports life.

§. 1249. **T**HE waters may likewise be dissipated by a rigid abstinence from drink, and living upon biscuit with a little salt, and a very small quantity of rich wine.

This method also has sometimes been tried with success. Nay, great physicians have expected a cure from it, if the viscera were not corrupted, and if no insurmountable cause of the disease was concealed in the body; in such case no method will cure, and all that can be done is to apply palliative remedies. All physicians are unanimous in advising, that the patients should drink very sparingly, and that what they drink should be very strong: but few can support a strict abstinence from all drink; wherefore we see that physicians have been solicitous to find out such things as might allay the urgency of thirst, and render abstinence from drinking supportable. Sydenham<sup>a</sup> directs that the mouth should be washed with cold water acidulated with elixir of vitriol: he advises also the chewing of lemons, or keeping tamarinds in the mouth. Others persuade the holding liquorice-root in the mouth; which root from this use has been called *adulc.* All these things have this effect, that either by the motion or chewing, or by a gentle stimulus on the glands, the mouth is kept moist, and the thirst thereby rendered less tormenting. For the same purpose, some advise the eating biscuits with a little salt: for though all salt things taken in large quantities, increase thirst; yet a little salt, by stimulating the salival glands, moistens the mouth. The Asiatics know this: for they rub the tongue and gums of their camels with salt, on journeys through dry and desert places; by which means these animals endure the want of drink for ma-

ny days. The warlike nation of Hungary refresh their tired and thirsty horses by the like method.

With how great difficulty dropfical persons endure their prodigious thirst, appears from the instance of Antigonus's friend, who was carefully kept from all drink by the king's order, yet hastened his death by drinking his own urine <sup>b</sup>. Metrodorus, a disciple of Epicurus, attempting to cure himself of a dropfy by abstinence from drink, and not able to support thirst, drank, and then vomited up the liquor again: whence Celsus makes this conclusion, " Now, if whatever is taken be brought up again, it lessens the uneasiness considerably; if it be retained in the stomach, it increases the disorder; therefore this must not be attempted by every one <sup>c</sup>."

There have been some, however, who have been willing and able to endure the torment of thirst, and saved their lives at this price. A surprising case particularly is related of a dropfical peasant <sup>d</sup>, of whose cure the physician despairing, that he might however give him some advice, said with a smile, *Friend, if you would be cured, you must drink no more than is absolutely necessary to support life*. A year after, he returned to the physician to obtain permission to drink, he having totally abstained till then from drink. The physician readily gave leave, and the peasant continued in health.

A Piedmontese nobleman, who had an ascites, was completely cured by total abstinence from drink for a month <sup>e</sup>. Dr Mead <sup>f</sup> saw two persons cured of a very bad ascites, by abstinence from drink; but they washed their mouths and fauces with juice of apples or lemons, and thus allayed their thirst.

Biscuit is allowed for the food, principally because it is very easy of digestion, dissolving as it were instantaneously, being grateful to the taste, and not loading the stomach. A small quantity of racy wine, such as Greek and Spanish wines, Tokay, &c. are advised also, to recruit the strength; which end it answers very well,

<sup>b</sup> Celsus, lib. iii. cap. 21. p. 161. <sup>c</sup> Ibid. p. 162. <sup>d</sup> Marcell. Donat. Histor. lib. iv. cap. 21. p. 134, versa. <sup>e</sup> Hildan. Observ. Med. Chirurg. cent. iv. obs. 41. p. 313. <sup>f</sup> Monit. et Præcept. Med. p. 143.

§. 1250. **T**HE third indication of §. 1231. is best answered by chalybeate wines, by steel in substance, and by corroboratives that are gently astringent, given in due time, and in a proper quantity; by dry food, generous old wine of an astringent quality, and by exercise.

The general indications for the cure of a dropsy were enumerated at §. 1231. We have considered the two first of these: it remains that we treat of the third and last, namely, how to restore the soundness and strength of the debilitated and diseased viscera, whether their disorders be the cause or the effect of the dropsy.

Sydenham<sup>a</sup> acknowledges a weakness of the solids to be a cause of dropsies; and he has remarked, that women, whose fibres are more relaxed, have this disorder more frequently than men. He also observes, that this disease increases more in winter than in summer, and more in rainy than in clear weather. Cold, indeed, rather braces the solids; but it is to be noted, that persons in a dropsy do not bear cold well: hence they are perpetually sitting by the fire, or keep up in rooms well warmed with stoves, in slothful rest, and can scarce use any exercise; whence their debility and inactivity increase. He also accounted one cause of the dropsy to be a mucous lentor and coldness of the fluids, which he called a weakness of the blood; which cacochymia he had observed to arise from too great a loss of blood by wounds, or from too frequent bleedings, as also from such food as could not be subdued and assimilated by the efficacy of the viscera, vessels, and sound humours before existing in the body: hence, instead of wholesome blood, vitiated humours were formed, and such a cacochymia followed as very commonly terminates in a dropsy. He has observed, that a like depravation of the blood ensued, where persons indulged themselves intemperately in the use of spirituous liquors: for, in this case, the vessels are distend-



ed daily; the veins are turgid and inflated; and presently after, when these spirits are dissipated and exhaled, all the vessels collapse, and the unhappy persons need a new stimulus, to give them vigour for performing their usual functions.

Now it was demonstrated, at §. 25, n<sup>o</sup> 3. that excessive tension of the solids first brought weakness upon them: when therefore the vessels are daily thus overstretched, they lose at last almost all their strength; and the paleness, lank cheeks, and trembling hands, too well declare the unhappy condition of those who constantly indulge themselves in drinking spiritous liquors. The reader may look back to §. 605, n<sup>o</sup> 11. where mention is made of the pernicious consequences of intoxication. Besides, great thirst generally follows drunkenness, which makes them who have been intemperate drink plentifully of water, which cannot be subdued nor expelled by the weakened vessels; wherefore, being collected in the cavities of the body, it produces various species of dropsies.

It is evident therefore, that a weakness of the viscera and vessels is justly accounted one cause of a dropsy; but this weakness is likewise sometimes an effect of a dropsy. We said, at §. 30. that watery liquids weakened the fibres; and at §. 35. that aqueous remedies, internally and externally applied warm to over-rigid fibres, restore to them their due flexibility. When therefore we consider, that, in an ascites, all the abdominal viscera are for many months, nay for years, soaked in a warm watery serum, it is easy to see that there is reason to fear debility as an effect of a dropsy. When we reflect, that in an anasarca the skin is prodigiously distended, and the adipose membrane filled with a watery humour, we shall not wonder, that, when the water is drawn off, all these parts become flaccid; therefore, after the evacuation, care is to be taken for corroborating these parts, and especially if the evacuation has been sudden either by tapping or by evacuants. If, indeed, the dropical swellings have gradually been diminished by dispersion (§. 1248.) or by obstinate abstinence from drink (§. 1249.)

(§. 1249.) the solids have every day less and less tension, and insensibly contract by their own elasticity, and acquire their due tone.

By what method, and by what remedies, strength and firmness may be restored to the relaxed and debilitated solids, was explained at §. 28.

But physicians have placed great and deserved confidence in the use of steel, either in substance, or dissolved in a vegetable acid <sup>b</sup>; especially with the addition of spices, and such other remedies as have a corroborative and astringent quality. In the *Materia Medica*, under this head, is a formula of such a medicated wine; where, however, it would have been better to order four pints of Rhenish, instead of two; for all these things act first on the stomach, and, if they are strong, prove offensive to it. Sydenham advised the use of steel, not only to corroborate the body after the water was let out, but even in the incipient dropsy, “when it has swelled the feet only, or but very little swelled the belly <sup>c</sup>.” He says, that frequently warm corroboratives are sufficient, without using emetics or cathartics. He also observes as follows: “When we attempt to conquer this disease, either by corroboratives or by lixivial preparations, the patient must not be purged at all, neither with gentle nor with strong physic, so long as we persist in our intention of invigorating the blood: for a purge overthrows all the benefit gained by the use of corroboratives; which every one must needs own, who has observed, that a dropical swelling, which had gone down by the use of corroboratives, rises again presently after purging.” But he here speaks thus of those cases in which there is room to expect that a dropsy may be cured by the use of corroboratives alone. For when the cure is attempted by evacuating remedies, and the patient’s strength will not allow of purging every day, he does not disapprove the use of corroboratives on the intermediate days <sup>d</sup>: for, as we mentioned before, at §. 1237. a

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<sup>b</sup> Boerh. Chem. Tom. II. p. 438, et seq.  
p. 633. <sup>d</sup> Ibid.

<sup>c</sup> *Tractat. de Hydrope,*

woman was happily cured of a dropſy (both of an aſcites and an anafarca) by drinking beer medicated with ſteel filings, aſhes of broom, and muſtard ſeed, purges being however taken at intervals.

A dry diet ſhould be ordered in this caſe, of biſcuit, or at leaſt well-leavened and well-baked bread, roaſt fleſh of young animals, river-fiſh broiled; the drink ſhould be ſparing and ſtrong; generous red wine too, which is likewiſe aſtringent, is alſo of great ſervice; and that the flaccid inteſtines and ſtomach may be moderately ſtimulated, ſome acrid ſeaſoning may be mixed with the food, ſuch as muſtard, horſe-radish, pepper, and the like; regard being had to the ſeaſon of the year, and the age and conſtitution of the patient recovered of the dropſy.

But the greateſt hope of preventing a relapſe is placed in wholeſome exerciſe; for nothing ſtrengthens more, or better diſperſes ſuperfluous humours from the body. This was the reaſon why Hippocrates, in the paſſage quoted above, (§. 1230.) where he enumerates the ſigns which ſhew a poſſibility of recovery, mentions as one principal ſign of this, the patients being able to ſupport fatigue eaſily; and, as was obſerved before at §. 1235. he enumerates vigorous exerciſe among the principal remedies for the cure of a dropſy. We read alſo of a fiſher<sup>c</sup>, whoſe belly was prodigiouſly ſwelled, but who brought down the ſwelling by conſtant toil, and was perfectly recovered without any medicine.

We muſt not, however, conceal what Celfus ſays of the dropſy: *However, in the beginning the cure is not very difficult, if reſt, thirſt, and faſting be ſtrictly enjoined<sup>f</sup>.* Of how much ſervice thirſt, obſtinately endured, may be in a dropſy, we have already obſerved. Hippocrates ſays, *Perſons of a moiſt habit ſhould faſt, for faſting dries the body<sup>g</sup>.*

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<sup>c</sup> Marell. Donat. de Med. Hiſtor. Mirab. lib. iv. cap. 21. p. 235, verſa.

<sup>f</sup> Inter initia tamen non difficillima curatio eſt, ſi imperata ſint corpori, ſitis, quies, inedia. Lib. iii. cap. 21. p. 161.

<sup>g</sup> Corporibus humidæ carnes habentibus, famem inducere oportet; famēs enim exſiccāt coporā. Aphor. 69. ſect. 7. Charter. Tom. IX. p. 346.



Perhaps thirst and fasting may have been tried for the cure in the beginning of this disease ; although it seems cruel to torment the patient both with thirst and hunger : but I remember no author besides Celsus, and he only in this place, who advises rest. Indeed the patients, enfeebled by abstinence from drink and food, can scarce be supposed able to bear exercise and motion. This method of cure seems to have been attempted in the friend of king Antigonus, since he swallowed not only his own urine, but also his malagmata<sup>h</sup>. But that Celsus commended exercise in other cases, appears from what follows : *And with regard to this, whatever species it is, if it has not got too great a root, the very same remedies are necessary. The person must walk much, run sometimes, &c.*

For corroborating the flaccid parts, bandages are of signal service, after the water is quite evacuated, and the swelling has subsided ; of the great usefulness of which we made mention at §. 28, no 3. It is likewise of service to impregnate these bandages in the aromatic fumes of amber, olibanum, mastic, storax calamite, benzoin, &c.

§. 1251. **A** T Y M P A N Y is cured by the same remedies and method, if it arises from the rarefied steams of the extravasated putrid humours ; for when this cause is removed, the effect ceases. But if it arises from air penetrating into the cavities through the putrefied membranes of the intestines, and not able to return, but rarefying by the heat of the body ; then all the parts soon putrefy, and the disorder from this cause is almost always incurable. For this reason, a dry dropsy is accounted much more incurable than one from water. Puncture often pro-

<sup>h</sup> Celsus in the passage just quoted.

<sup>i</sup> Atque hic quo que, quæcunque species est, si nondum nimis occupavit, iidem auxiliis opus est. Multum ambulandum, currendum quædoque, &c. *Ibid.* p. 162.

procures relief, but seldom a cure. Rollers are useful, after the puncture is performed.

At §. 1226. we treated of the tympany, or dry drop-sy, and its diagnostics: we are now to consider the methods of cure. We then observed, that there were two species of a tympany: for either the air is lodged at large in the cavity of the abdomen, or the intestines and stomach are distended and swelled with it. At the same time instances, on which one may depend, were brought to prove, that a tympany from air, occupying the cavity itself of the abdomen, was very rare; and that it much more frequently proceeded from the air distending the intestines and stomach. The signs were also then mentioned, by which we might distinguish these two kinds of tympanies.

It is known, that heat turns water into vapours, which occupy a much larger space than the water from whence they arose: hence, if part of the water contained in the cavity of the abdomen should be changed into vapour, the swelling of the abdomen in an ascites would be greatly increased. At the same time, in that chapter, we frequently took notice, that the cavities of the body, in a natural state, were filled not with water, but with a subtle steam, which after death condensed to water. In treating of the cure of a dropsy, we observed that physicians endeavoured, by the heat of the sun, fire, &c. to change part of the extravasated water into vapours, because in this form it would seem more easy to be resorbed by the veins; and therefore, from such a rarefied vapour, a cure of this disorder might be expected, rather than an increase of it: for if this vapour, formed by the application of external heat, should not be re-absorbed by the abatement of the heat, it would condense into water, and thus no increase of the swelling would be caused.

But when we treated of Eructions and Flatulencies, it was proved, that great quantities of air lodged both in the fluids and solids of vegetables, and of animals, and was inherent there in such a manner, that  
while

while it continued involved in them, it had no elasticity. At the same time it was shewn, that putrefaction dissolved this bond and connection of the air with the parts of our bodies; and that as soon as ever the air is set at liberty, it recovers its elasticity, and occupies a much greater space than before. If, therefore, the water contained in the cavity of the abdomen begins to putrefy, a tympany may accompany an ascites; and (as was said at §. 1226.) then, if we strike the upper part of the abdomen, it will sound like a drum, and a manifest fluctuation of water will be perceived at the same time in the lower part of the abdomen: then especially the prognostic of Aretæus<sup>2</sup> takes place, who pronounces all kinds of dropsies dangerous, but that a combination of them is worst of all.

Certainly, if the air generated from putrefaction, being again become elastic, distends the abdomen, the source of this putridity, that is, the water extravasated and stagnating in the abdomen, must be removed; therefore, for curing the tympany in this case, the ascites itself must first be cured.

But how little hope will remain, when the liver and spleen have been long soaked in this putrid fluid? All will melt down into a putrid gore, and certain death ensues.

Tapping itself, although of its own nature it is a remedy safe enough, yet by giving admission to the external air, will increase the putrefaction already begun. Nor will the other methods, mentioned in treating of the cure of an ascites, be more successful: for they are all violent, cause strong motions, and sometimes excite vomiting; which certainly is always dangerous, when the viscera, long macerated in the putrescent water, begin to be unsound. External heat, applied with an intention of dispersing the water, will, by the rarefaction it causes, increase the swelling. The thirst, which is always excessive when the water begins to grow corrupt, becomes absolutely insupportable; nay, the putridity will increase by absti-

<sup>2</sup> De Causis et Signis Morbor. Diuturnor. lib. ii. p. 49.



abstinence from drink, as drink helps to wash off some part of the putrid matter from the body.

If, the intestines being perforated by worms, or corrupted by a gangrene, the air gets a passage from thence into the cavity of the abdomen, it will there be more and more rarefied by the heat of the body, all things will soon grow corrupt, and scarce any hope, it is evident, will remain.

The reason therefore is clear, why physicians have almost always despaired of curing a dry dropsy. Whence Aëtius says, “ A tympany is always very dangerous : an  
“ ascites is less dangerous ; for therein we may use  
“ pertusion or puncture, which the Greeks call para-  
“ centesis ; and it yields likewise more readily to reme-  
“ dies, than does the forementioned disorder <sup>b</sup>. ”

But if the stomach and intestines, being enormously distended with air, cause the tympany, there is more hope, although this itself is a disease very difficult of cure. Before, at §. 1226. we observed, that air existed in the stomach and intestines ; but that it was so repressed by the action of these viscera, that it could not distend them : therefore the expansive force of the air, and the contractile power of the intestines, may be considered as two opposite powers. If the contractile power of the intestines has the prevalence, their cavity is very inconsiderable. Wherefore, when an animal is dissected alive, on cutting open the abdomen, the intestines appear smooth and solid : in a carcase after death, the intestines are dilated, thin, and almost transparent.

In the chapter where we treated of Eructations and Flatulencies, it was shewn, that an irritating acrid cause so contracts the part of the intestines to which it is applied, that nothing can pass : when this happens in several parts, the intercepted air expands, and dilates the cavity of the intestine prodigiously. This kind of spasm also happens in hysterical and hypochondriacal persons, from the passions of the mind, as all know. If now causes like these are either very violent, or very frequently repeated, or last very long, the

the contractile power of the intestines is either destroyed, or so much weakened, that the expansive force of the air has always the prevalence, and then a tympany will take place. We said at §. 1226. that the intestina crassa were sometimes so much dilated by a tympany, that they were as big as a man's thigh. If the distended intestines or stomach contracting themselves expel the rarefied air, or the rarefaction of the air itself be diminished by any cause, this occasions flatulles; the persons in whom they are frequent, are said to have a flatulent disorder: but if this flatulent tumour remains obstinate, and the air find no passage, then a tympany subsists. Sydenham<sup>c</sup> was surprised to see, that in a dropical patient, from whom the water had been evacuated by powerful emetics and cathartics, the belly suddenly swelled again as much as ever; especially as he found, that, on giving a purge or an emetic, the swelling rose even to the throat, and was accompanied with a difficulty of breathing, which continued "till the body was freed from the  
"troublesome operation of the evacuating remedies,  
"and recovered its natural tranquillity; whereupon  
"the swelling and the other symptoms presently disappeared, till they were excited again by the irritation of another purge." Wherefore, as after all the waters were evacuated the same troublesome symptoms lasted for a week after the last purge, he was obliged to give an ounce and an half of diacodium four nights running; and the dose was even to be repeated, if the patient did not get sleep in three hours after taking it: this appeased all the disturbance, and the swelling subsided. I once observed such a sudden swelling, after the water had been almost totally evacuated from the abdomen by diuretics, in a woman who had an ascites: I gave her an aromatic powder composed of the *species diagalangæ et cortex magellanicus*, and the swelling subsided in a few hours: this disease might have been called a tympany; for the abdomen, when struck, resounded like a drum. But if the stomach or intestines remain long distended, the cure is often

difficult, as these viscera then lose all their contractile power.

For the cure therefore of a tympany, it is requisite that the contractile force of the stomach and intestines be augmented; and that the rarefaction of the air contained in these viscera be diminished. Physiology<sup>d</sup> teaches us, that the stomach and intestines have a power by which they press on their contents, and squeeze from them all that is dissolvable, and urge on the remaining excrementitious part to the rectum, thence to be expelled from the body. But when this power of these viscera is diminished or destroyed, they are liable to be over-distended by the air, as sometimes happens in diseases at the approach of death, and is almost always observed after death. At the same time we mentioned, that by any acrid thing, or by a mechanically wounding cause, these viscera are so constricted, as to suffer nothing to pass through them; and hence they are capable of being amazingly dilated, by the intercepted air between the obstructed places. Wherefore, as was mentioned at §. 1226. costiveness, gripes, and pains of the loins, are wont to precede a tympany: for the same reason, it is reckoned a good sign in a tympany, if borborygmi are perceived in the abdomen; for these shew, that the flatulent matter is agitated in the cavity of the intestines by the peristaltic motion; especially if flatuffles break forth soon after the borborygmi; for then the swelling will soon subside, by the intestines recovering their tone.

There seems to exist, in a healthy state, a stimulus which excites the cavity of the intestines to contractions: most foods have either naturally, or acquire by delay, such an irritating quality. Whence from milk (which is so mild a food) turning sour in the stomach and intestines of young persons, so often proceed gripes and a swelling of the abdomen. The bile in a sound state, which seems to have a greater acrimony than other healthy fluids, appears to have this effect. Before, at §. 312. where we treated of Wounds of the Abdomen, a remarkable instance was related of a soldier, the



the bottom of whose gall-bladder had been pierced with a wound, without any considerable damage being done to the adjacent parts. Presently the abdomen swelled, and the swelling continued till after his death. No eructations, flatulencies, or borborygmi were perceived; the belly remained constipated, although very sharp purges and clysters were administered. The irritation proceeding from the sound bile, is natural, and useful to the body: and when the belly rumbles in hungry men, this seems to be occasioned by the bile overflowing into the stomach, or flowing through the intestines; for men in this case often belch a frothy humour, inclining to a bitter taste.

From whence it appears, that the tympany may arise from the contractile force of the intestines in general being destroyed, or when the passage of the intestines is obstructed in some part of it; and hence the part above the obstruction swelling, loses its tone by being overstretched: whence, in the bodies of those who die of this disease, the intestines are found greatly strained in some places, and enormously dilated in others. Hence, in the beginning of this disease, the spasmodic constriction must be relaxed, in order to prevent the excessive dilatation of those parts which are not constricted by the spasm. How and by what remedies this is to be effected, was mentioned in the chapter of Eructations and Flatulencies, particularly at §. 650. But when a long dilatation (either in whole or in part) of the intestines has entirely overcome their contractile power, then a stimulus is necessary to urge the sluggish fibres of the intestines to motion, and afterwards corroboratives to restore the due tone and firmness of the dilated parts.

If now we examine what are the remedies prescribed by the most skilful physicians for the cure of a tympany, it will appear that they are such as answer the indications we have mentioned. Celsus, speaking of the cure of this disease, which he calls *inflation*, first seems to mention such things as are proper in the beginning of this disorder; for he says, *si ex ea (inflatione) dolor creber est*, “wherefore, if there be fre-

“quent pain from it (*i. e.* from the inflation<sup>c</sup>.”) Now it was noted before, at §. 1226. that gripes preceded a tympany, the flatulles being intercepted by spasmodic constrictions in various parts of the intestines. Then he advises a vomit every day, or every other day, after eating; also dry warm fomentations, and cupping without scarification. He goes on, *sine per has etiam tormentum tollitur, incidenda cutis, et tum his utendum*; “if the pain does not yield to that, the skin must be cut, and the cupping instruments applied again.” If even this did no service, then the remedy was, *per alvum infundere copiosam aquam calidam, eamque recipere*; “to inject into the belly plenty of warm water, and to take it back again.” All these methods seem adapted to relax the spasm. But when the intestines have remained long dilated, then there seems occasion for irritating remedies, that the fibres of the intestines, overstretched and become almost paralytic, may recover motion: for he advises to apply mustard frequently to the belly, till it corrode the skin; nay, that ulcers should be made in the belly with hot irons, and that they should be kept open for some time. Boiled squills also bound on the belly, says he, are good<sup>f</sup>. Now, although these applications only irritate the external teguments of the abdomen, yet an alteration is caused hereby in the internal, appears from what was said in the chapter concerning Eructations and Flatulles.

Some physicians have applied to the abdomen, water rendered extremely cold by ice or snow; and have also ordered it to be drank, with good success<sup>g</sup>. Certainly such a sudden cold contracts the solids, and at the same time checks the expansion of the flatulent matter, and thus is useful in two respects. Whence cold water so applied, is deservedly esteemed a corroborative

<sup>c</sup> Lib. iii. cap. 21. p. 163, 164.

<sup>f</sup> This (says Dr Grieve) seems a very odd way of using squills, the old reading appears much more just. *Utiliter etiam scilla costâ delinitur cutis*; “It does good also to rub boiled squills over the skin.” The same variety recurs at the end of the following paragraph; *sicut supra dixi delinitur*, instead of, *simul supra ventrem deligatur*. Grieve’s Celsus, p. 161.

<sup>g</sup> Combalufier Pneumato-pathol. p. 428, et seq.

borative remedy; but as soon as the abdomen begins to subside, it should be supported with rollers, that the stomach and intestines may not so easily be dilated again, but may resist the rarefied air which moves up and down their cavities.

We know, that the peristaltic motion of the intestines is much increased by the stimulating power of cathartics, and the fæces sooner excluded: for this reason, physicians have prescribed these remedies; and some have even recommended those of the most acrid kind, such as elaterium, orrice, and soldanella, together with aromatics and carminatives. But as the whole intestinal tube is not always distended in a tympany, but only here and there contracted; many have advised gentle purges, given in small doses with carminatives, in order to prevent costiveness: for the contraction in the obstructed intestines may be increased by violent purges, and Dr Pringle <sup>h</sup> has observed, that carminatives, without some gentle purge, are hurtful. Hoffman <sup>i</sup> also condemns strong purges; and advises those that are gentle, combined with anodynes; and directs that the abdomen should be well rubbed with camphire, dissolved in oil of sweet almonds.

The rarefaction of the air in the stomach and intestines is to be prevented as much as possible: But the air, when it is imbibed together with the food, either is separated from the aliments at the time of digestion, in which it was before imperceptible through want of elasticity; or, which is worse, is extricated by putrefaction. Hales <sup>k</sup> has shewn, that air is naturally inherent in bodies, and that it visibly constitutes a part of their bulk; and that the same air is again separated from them, when the connections of the parts with one another are destroyed or diminished by fire, fermentation, putrefaction, effervescence, or other causes. He has in like manner demonstrated, that the air, by separation from other bodies, is rendered elastic; and

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<sup>h</sup> On the diseases of the army, p. 252, 253.  
System. Tom. IV. parte iv. p. 45.

<sup>i</sup> Med. Rat. et  
<sup>k</sup> Vegetable statics, chap. 6.



when again combined with them, it loses its elasticity. He has also taken notice, that aqueous vapours diminish elasticity, whether they arise from pure water, or are exhaled from the bodies of animals: hence it is, that by respiration itself the elasticity of the imbibed air is lessened. Now if we consider, that at the time of digestion the aliments are dissolved; that some tend to fermentation, and others to putrefaction; a separation of the air from the food will be supposed of course to ensue: which, unless it be again absorbed, and by that means deprived of its elasticity by warm vapours exhaling from the extreme arteries into the cavities of the stomach and intestines, will distend these viscera, and so much the more by how much the viscera are less firm; and by that means they will be less able to resist the expansion of the air. In healthy constitutions, during the natural digestion, more air appears to be generated than reabsorbed; hence all men are more or less swelled after eating: but in weak constitutions, troublesome flatulencies are occasioned, especially in those who have taken such food or drink as naturally contain much air, which is easy to be separated from them, or else they are very obnoxious to fermentation or putrefaction. From which it is plain, that to those who labour under a tympany, crude summer-fruits, rape-roots, radishes, &c. are pernicious.

Hales<sup>1</sup> found, that the steam of sulphur most powerfully absorbed the air, or diminished its elasticity. An accidental practical case has demonstrated that *spt. sulphuris per campanam* is of service in this disorder m. Francis Oswald Grembs had in vain tried to cure a tympany by hydragogue purges. He afterwards directed a fomentation of the patient's urine and lapis prunellæ, having scarce any hope of a cure. The patient desired something to allay his thirst. The physician had some *spt. sulphur.* at hand, of which he directed him to take some drops in a glass of water. This not only allayed the thirst, but also carried off a prodigious quantity of flatus; the belly subsided, and the

<sup>1</sup> Ibid. p. 226.

<sup>m</sup> Combalusier Pneumato-Pathol. p. 455.

the patient was perfectly recovered. The efficacy of the steam of sulphur for preventing fermentation, or stopping it if already begun, is well known. Now fermentation generates great plenty of elastic air.

When the intestines have not yet lost all their contractile power, which is however too weak to expel the distending air, whenever the elasticity of the air is diminished by any cause, the contractile force begins to prevail, and expels the wind. This seems to have appeared in the cause above related; where by drinking plenty of water, with which was mixed *spiritus sulphuris per campanam*, the rarefaction of the air, which distended the intestines, was diminished, and the peristaltic motion had the prevalence. And this salutary effect seems also to have been promoted by this circumstance, that, the intestines being now more contracted, the exhaling arteries became capable of emitting a warm watery steam, which likewise absorbs the air and diminishes its elasticity.

But all these things take place, chiefly when the elastic air moves up and down the cavity of the stomach and intestines, and cannot easily be expelled; for the intestines may also be the seat of an emphysema. Anatomy teaches us, that the mesentery is formed from the duplicature of the peritonæum. When the mesentery approaches any of the intestines, these two folds of the peritonæum recede from each other, and inclose the intestine on all sides, so that the part of the intestine which is nearest to the mesentery is not covered by the peritonæum. But the cellular membrane of the mesentery, which lies between the duplicature of the peritonæum, in like manner extends to the intestine, and is applied to that side of the intestine which is not covered by the peritonæum. This cellular membrane grows less and less conspicuous, in proportion as the peritonæum approaches more closely to the intestine, and at last quite disappears, and therefore does not surround the whole intestine: this is called the *exterior* cellular membrane. There is also another called the *interior*, placed under the muscular tunic of the intestines, which was formerly called

ed the *nervous* tunic, but is truly *cellular*. In both these tunics an emphysema may arise, as well as every where else all over the body; and such a disease has been observed<sup>n</sup> to exist, as the intestines have been found occupied by such an emphysema in many places: and an emphysema has been seen, not only on their external surface, but within (when the intestine has been turned inside out) also a swelling of this kind has been found exactly in a correspondent situation to that without; and some of these tumours were so protuberant, that they almost stopt up the whole intestinal tube. Anatomical experiments also shew, that air blown in through the exterior cellular membrane of the intestines, distends also the interior cellular membrane. But other viscera also have been observed to be affected with an emphysema. I remember to have seen such a small emphysema in the convex surface of the liver under the external tunic. But, which is much more wonderful, in a man who died suddenly of a violent cough, after death “the lungs were  
“ found all over hard, inflated, and very elastic; the  
“ air effused between the membranes, which invests  
“ the lungs, had formed many bladders of various si-  
“ zes; the air could by no pressure be expelled thro’  
“ the wind-pipe; the lungs, when cut into bits, did  
“ not at all collapse, and all the bits remained equal-  
“ ly inflated and elastic.”

If now such an emphysema occupy the intestines, the swelling of the abdomen will not indeed be so considerable as is observed in the former kinds of tympany, but the same treatment will be proper. The cure however will be more difficult, as the remedies taken, while they pass through the cavity of the intestines, can exert but little force on such an emphysema.

Is there room for puncture, if the tympany yield to no remedies? If the tympany occupies the cavity of the abdomen itself, it is easy to see that little is to be hoped: the patient may perhaps be relieved from  
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<sup>n</sup> Ibid. p. 18. Comment. Acad. Petropol. Tom. V. p. 213.

<sup>o</sup> Storck Ann. Med. p. 115.



the troublesome tension occasioned by the air; but as the putrid source remains, it will produce the tympany again. It is true indeed, that the abdomen may be supported by rollers, as was mentioned in treating of the cure of an ascites; but if elastic air be generated again in the cavity of the abdomen, it will occasion such an oppression and difficulty of breathing, that the constriction of the abdomen by rollers will not be supportable.

But if the air lodge not in the cavity of the abdomen, but in the stomach and intestines, puncture will not discharge it, unless these viscera be pierced. Before, at §. 316. when we were treating of Wounds in the Abdomen, it appeared that surgeons, when any one of the intestines were swelled and distended with air, pricked it with a needle, that it might collapse; without which it could not be replaced in the cavity of the abdomen: and at the same time it was said, that Paræus had performed such punctures with success. But these were very small wounds, and such as, when the intestine contracted itself again, would entirely disappear; which certainly cannot be expected in a tympany. For tapping must be performed on the abdomen with a larger needle; as there often issues forth a quantity of water together with the air, and as the intestines so long distended with air have lost much of their contractile force: whence there would be cause to apprehend that the intestinal tympany might be followed by a tympany of the abdomen; and the contents of the intestines might get into the abdomen, through the hole made by the trocar in the intestines; which contents corrupting there, would produce new and incurable evils.

Monf. Combalusier<sup>P</sup> discourses very prudently of the puncture of the abdomen in a tympany; and justly observes, that we have no experience of the operation of tapping with success in a tympany. The puncture was made in a patient's breast, which was thought to be full of pus; and instead of pus, air rushed forth with a great noise, and the patient recovered.

covered<sup>¶</sup>. An attempt of this kind would be hazardous; but where certain destruction is at hand, a doubtful remedy may be tried, the physician forewarning the patient of his extreme danger, that his own reputation may be safe. Tapping should in this case be performed in the same method, and with the same cautions, as were mentioned in the treatment of an ascites. The trocar however should be here of a less diameter, that so small a wound may be inflicted on the intestine, as may more certainly and speedily close than if a larger needle were employed.

§. 1252. **T**HE *first* kind of hydrocele, mentioned at §. 1227, is cured, 1. By curing the anasarca, (§. 1231, to 1238.) whose offspring it is. 2. By the remedies prescribed at §. 1248. 3. By the most powerful discutients combined with corroborants, applied to the scrotum, and put into greater motion by a constant external heat.

But the *second* kind, (§. 1227.) is best cured, 1. By a radical cure of the hernia. 2. By removing the material cause of the ascites, and stopping the source of it, as directed at §. 1238, to 1252. 3. By compressing the part with a truss, as in ruptures. But a dropsy once formed here, is seldom perfectly cured.

The *last* kind, (§. 1227.) is cured, 1. By strong hydragogue purges frequently administered, and by a drying diet. 2. By the strongest discutient and corroborant applications. 3. By puncturing the scrotum. 4. By caustics, and by promoting a suppuration.

We spoke before, at §. 1227. of the different kinds of hydrocele, as also of the signs by which they might be distinguished. We then saw, that the first kind

was

¶ Ibid. p. 508.

was a true anasarca, and rarely occupied the scrotum, unless the rest of the body were affected by it: therefore all that relates to the cure of an anasarca, takes place here. And there is also this convenience in this kind of hydrocele, that as the whole scrotum is prominent, it may be wrapped quite round with discutients and corroboratives, and lies open for using steams from burning aromatic, amber, mastic, and the like.

The second kind, §. 1227. was that in which the bag formed from the production of the peritonæum in a rupture, was filled by the water occupying the cavity of the abdomen, if an ascites; or by elastic air, if a tympany accompanied these ruptures. The cure of such a disorder is to be obtained by radically curing the hernia; which is done when the intestine or caul inclosed in the bag of the rupture, is not only replaced in the cavity of the abdomen, but also the sides of such bag grow close together, so that nothing can enter it again. But it is obvious, that the radical cure of the rupture is scarce to be attempted, till, by the removal of the ascites or tympany, the swelling of the abdomen has subsided; therefore the cure of these must precede. It is indeed true, that by trusses the place may be so compressed, after the reduction of the rupture, that the bag of the peritonæum will no longer admit a part of the intestine, or of the omentum; but it will be much more difficult to hinder the water from sliding into it, if the abdomen be full of water; besides, the belt which supports the trusses, and keeps them in their place, can either not at all, or with the greatest difficulty, be put round the distended abdomen. From whence it appears, that an hydrocele arising from this cause can seldom be perfectly cured, unless the water of the ascites be entirely evacuated; for if even a small quantity of water be left in the abdomen, or if, after it has been all discharged, more collects there, (the cause of the dropsy not being radically removed), it necessarily tends to the lower part of the abdomen by its weight, and distends the hernious bag afresh.

It remains therefore only that we treat of the last species



species of the hydrocele, described at §. 1227. wherein the water is collected, and lodges in the *involucrum vaginale*. The cure of this is to be attempted by the following methods.

1. By hydragogues, &c.] Of this method mention was made at §. 1227. If, as good observations have shewn, the abdomen filled with water can be emptied by purges, we may with much more reason hope such an effect in an hydrocele, when frequently the rest of the body is healthy; especially if hydragogues are administered in the beginning of the disorder, together with an exsiccating diet. I have seen the cure of an inveterate hydrocele attempted by purging, but never with success: for the containing parts are so altered by the excessive distension they have undergone, that there seems scarce any room to hope that the water should be re-absorbed; which re-absorption however is absolutely requisite, in order that the water contained in the tunica vaginalis testis may be evacuated by cathartics.

2. By strong discutients, &c.] This method is often very serviceable, especially in the beginning of the disease: but as an hydrocele is not very troublesome at first, the patients scarce fly to such helps till the swelling is come to a great size. Discussants and corroboratives, as we said before, may be applied at will all round the scrotum. Very efficacious prescriptions are to be found in our author's *Materia Medica* under this head: for instance; a poultice composed of powerful discutient simples, then a corroborative and discutient fomentation. The use of decrepitated sea-salt perfectly dried, is also recommended, as powerfully drawing the water from other bodies to itself, as we have already mentioned. Lastly, we find there a fumigation composed partly of corroboratives, and partly of discutients, which is also of signal efficacy.

In young boys, and sometimes in new-born children, I have frequently observed such an hydrocele beginning; and this disorder was soon and happily cured by the use of such a fumigation. Dr Monro<sup>a</sup> also cured

<sup>a</sup> Medical essays and observations, Vol. V. p. 312.

red this disease in new-born children, by applying to the part a flannel cloth impregnated with the steam of burnt benzoin. But at that age all the vessels are free and open; whence there is great reason to hope, that the water may be reformed. Nay Hippocrates, when he enumerates the diseases to which those who inhabit a northern city are liable, says, *Children while they are little have hydroceles, which, as they grow up, disappear*<sup>b</sup>.

3. But when the disorder is grown inveterate, and the scrotum is swelled with water to a vast size, and the former methods have been tried without success, then the tapping of the scrotum takes place. Altho' formerly the waters were often discharged by pricking the scrotum with a lancet, yet now almost all surgeons chuse to employ the trocar; but the needle must be less than that employed in tapping the abdomen. Care must be taken not to injure the testicles, or the spermatic chord: for it sometimes happens, that an hydrocele is the consequence of a schirrhous of the testicle, which indeed may be known from the history of the disease; but sometimes ignorant men apply for help when the disease has been of long standing, who have not been attentive enough to be able to remember what were the symptoms in the beginning of the disorder. It is true indeed, that if the water is transparent, and a candle be put in a dark place behind the swelled part, that then the whole bag is pellucid, and the testicle may easily be discerned and avoided: but sometimes it happens, that the waters are opaque and turbid, and then nothing can be distinguished.

I have seen the operation performed on the scrotum successfully by the following method. The patient stood upright and straddling with his legs; a soft bandage of two fingers breadth was wrapped round the penis and the top of the scrotum, the ends of which bandage the patient himself held, and drew as tight as he could bear it, without making it painful, to the end that the lower part of the scrotum might be so much the more stretched. This done, a candle being

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placed

<sup>b</sup> Pueris autem hydropes in testibus sunt, quamdiu parvi fuerint, qui deinde ætate procedente evanescent. *De aere, aquis, et locis. Textu 21. Charter. Tom. VI. p. 192.*



placed behind the patient, if the water was transparent, the surgeon fixed the needle in the anterior and inferior part of the scrotum, in such a direction as that the point tended outwards: then the needle being drawn out, the water rushed forcibly through the pipe. This water is generally of a colour approaching to citron: and unless the scrotum has been distended enormously, and for a very long time, it contracts and wrinkles up in proportion as the water flows out; and sometimes with so much force, that I have seen the pipe, after the water was entirely evacuated, so pinched, that it was difficult to get it out. On this account it is usual to smear the pipe with oil of almonds, that it may be drawn out afterwards with less difficulty. The little wound made by the puncture becomes imperceptible, as the scrotum shrinks up, and requires nothing to heal it; so that the patients are able to return to their usual employments, as soon as they have been eased of this load.

But as the veins are often varicous and turgid in the distended scrotum, care is always taken that the needle shall not injure these veins. It is true indeed, that when the scrotum contracts after the water is let out, the orifice of the wounded vein is also diminished; but there is a danger lest the contraction of the wrinkling scrotum should place the wound made in the vein in such a situation, that it may drop the blood issuing from it into the cavity of the tunica vaginalis, which would occasion new complaints; for certain experience has shewn, that an hæmorrhage sometimes follows the puncture of the scrotum, although this operation has been ever so skilfully performed. The puncture of the scrotum being made for the fourth time (for there was a necessity of repeating it every year) in a man of sixty years old, when twenty-three ounces of water had been let out, after a few minutes about twelve ounces of pure blood flowed forth in a full stream: after copious bleeding in the arm, this hæmorrhage ceased: the next morning, the scrotum swelled more than before: it was concluded to cut the scrotum; and an incision two inches long being made, the



the tunica vaginalis appeared found, but greatly distended; which being likewise cut, a great quantity of congealed blood came out, and more was drawn out by the fingers. As the testicle and its vessels, and all the adjacent parts, appeared found after the blood was wiped off, there seemed great hopes of a cure; which accordingly was effected in three weeks time; nor during three years that the patient lived afterwards did the hydrocele return<sup>c</sup>. I have seen a similar case, but where the hæmorrhage (which was pretty copious) came on later, namely the next day; and stopping from time to time returned several times, and then ceased, although the wound was not dilated, but only corroborating fomentations applied to the scrotum. Whether are the vessels, which have long been soaked in the surrounding water and consequently weakened, ruptured, when this support is removed? This seems probable enough, as the hæmorrhage did not immediately follow on the puncture, but after a considerable interval of time.

But, as was said in the cure of an ascites, tapping lets out the collected water, but does not remove the cause of the disease. Some instances shew that hydragogue purges, corroborative remedies applied to the scrotum, and a truss, have prevented a return: for the most part the disease is used to return, as the patients after the puncture, being relieved from their load, neglect the advice of their physicians; although we must confess, that even those patients have relapsed, who have been most observant of our directions.

But as the puncture of the scrotum is neither very painful or dangerous, if skilfully performed, many of those who are troubled with an hydrocele had rather undergo puncture than submit to the radical cure; of which we shall presently speak. Puncture of the scrotum is therefore called the palliative cure. I have known many who needed the repetition of the puncture once, twice, or thrice in a year. A reverend archbishop had such quick returns of the hydrocele, that he was obliged to have the scrotum pierced

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every

<sup>c</sup> Medical essays and observations, Vol. II. sect. 14. p. 253.

every month, for the space of three years.

But when the patients can no longer bear the trouble of repeated punctures ; or, the disease growing inveterate, the water issues no longer clear, but turbid and vitiated ; then the radical cure is required.

4. This radical cure consists herein, that all exhalation of humour into the tunica vaginalis be hindered ; which end will be obtained, if the tunica vaginalis be made to cohere with the testicle, by exciting an inflammation, and in consequence a suppuration (after the water is let out) all round the tunica vaginalis and nervous tunic of the testicle, that these parts, being cleansed from the pus, and all dead skin separated from them, may grow close together, and thereby the whole cavity which was the seat of the hydrocele may be abolished.

Celsus<sup>d</sup> makes no mention of the puncture of the scrotum to let out the water ; but describes only the radical cure, which he advises should be attempted even on children. But we have already seen, that a perfect cure may be hoped in young persons without this method. But Celsus orders the membranes which contained the humour to be cut away ; which shews this was a troublesome and painful operation.

Surgeons of note have advised various methods. Some cut the scrotum with a lancet almost down its whole length : Others have rather chosen caustics to make the opening, as the patients are frequently too much afraid of incision ; and the scar produced by the caustic raises an inflammation, and afterwards a suppuration all around, which are reckoned necessary circumstances in this method of treatment. Mr Sharp<sup>e</sup> prefers simple incision ; which by many experiments, in the course of a few years, he has found to have good success. Sometimes, when the scrotum is so enormously swelled by the hydrocele, that there is scarce room to expect that it will shrink up sufficiently, a part of the scrotum is cut down the whole length of the swelling, so that such an elliptical segment at  
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<sup>d</sup> Lib. vii. cap. 21. p. 468.  
present state of surgery, p. 87.

<sup>e</sup> A critical inquiry into the



its least diameter is an inch or an inch and a half broad. This author tells us however, that it has happened but three or four times that such an excision was requisite; namely, when there were fleshy concretions in the tunica vaginalis. Heister <sup>f</sup> says, that he had employed the potential cautery with good success, and had never observed any bad consequences from it. Both these methods have many eminent surgeons for their defenders. Bertrandi <sup>g</sup> thought it safer, when the hydrocele was of a great size, first to let out the water by puncture, then to use a truss and apply corroboratives; when the hydrocele began to swell again, before it had arrived at its former size, he repeated the puncture once or twice more, and then proceeded to the radical cure. And he very prudently considers, that there is less room to fear an hæmorrhage or mortification, if the strength of those parts, which have been so prodigiously distended, be gradually increased before the incision is made on the scrotum. This excellent surgeon has many other very useful observations on this disease, which deserve to be read.

After the scrotum has been opened, either by cutting or the potential cautery, all agree that a slight inflammation and suppuration must be raised, that the sides of the bag (when the pus of the suppuration is cleared away) may so cohere to each other, and to the adjacent parts, that the whole cavity which was the seat of the hydrocele may be abolished. Celsus <sup>h</sup>, as we have seen, directs that the membrane which contained the humour should be cut away. He adds, *Then it must be washed with water, with the addition either of salt or nitre.* Others have injected spirits of wine: but a violent inflammation has ensued, not without danger to the patient, which was with difficulty allayed by copious and repeated bleedings: on which account the ablution was afterwards attempted

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with

<sup>f</sup> Instit. Chirurg. parte ii. sect. 5. cap. 122. p. 847.  
 Acad. Royale de Chirurg. Tom. III. p. 3.

<sup>g</sup> Mem. de

<sup>h</sup> Deinde eluendum id ex aqua, quæ vel sale vel nitro adjec-  
 tum fuit. Lib. vii. cap. 21. p. 468.



with red wine, which succeeded better. The same intention of making these membranes to cohere, has also been pursued by the use of suppurating medicines lightly corrosive, especially when, as has been frequently observed to happen, the tunica vaginalis is grown very thick after the hydrocele has lasted a long time.

That great caution is requisite here, appears from hence; that most eminent surgeons, Sharp, Bertrandi, &c. warn us, that an inflammation excited in the tunica vaginalis is sometimes accompanied by so violent a fever, together with a delirium, spasms of the abdomen, and other bad symptoms, that the patient is in manifest danger of losing his life. Nay, Mr Sharp, although he had seen all the patients escape, yet confesses that this fever is more terrible than that which usually follows the extirpation of the testicle. Hence, fearing excessive irritation, and its most pernicious consequences, he condemns the cruel method of those, who, after cutting the scrotum, try to tear off the tunica vaginalis, thinking it to be a morbid cyst in which the dropical humour was lodged. The whole hope of a radical cure seems to depend on a mild suppuration; a gentle irritation therefore is requisite. That which is violent is not without danger, whether very acrid remedies, laceration, puncture, or the application of heterogeneous bodies, (for such various methods have been tried by different practitioners), be the means used to excite it.

§. 1253. **F**ROM all that has been said it appears, that in the cure of a dropsy, greater difficulty arises from the nature of the stagnant putrefied water, than from the original causes. And hence reasons may be given, Why, when the waters are drawn off, the mortification of the parts which floated in them, is hastened. Why, upon a sudden discharge of the water from

from the thorax or abdomen, death, or a violent syncope, ensue. Why dropfical patients are so very thirsty, and what this thirst denotes. Why acids are so frequently of service in this disease. Why, when a great quantity of water is discharged at once, by powerful evacuants, the swelling of the abdomen remains the same, or even increases; and why it subsides upon giving a sufficient dose of opium. Why bandages are so beneficial; and how far they are so.

Some corollaries now follow, which are easily understood from what has been said already.

In the cure of a dropfy.] If we look back to what was said at §. 1229. of the causes of a dropfy, it will appear that many of them may be overcome, or at least may be borne a long time without great injury; but if the water is become putrid, the viscera will be tainted and waste away, and death will inevitably soon follow.

Why when the waters are drawn off, &c.] When the viscera have long been soaked in the mass of water, these vessels lose almost all their tone, and can scarce any longer resist the impulse of the fluids. So long as the vessels are supported by the equable pressure of the water, the bursting of them is prevented, and this compensates for the weakness of the vessels: but as soon as the water is discharged, the vessels either burst, or at least their weakness renders them incapable of moving the contained fluids; whence the vital motion of the fluids through the veins and arteries is destroyed, and therefore a mortification follows. See §. 419.

We have observed already, that there was room to fear this bad consequence. That delicate membrane the retina of the eye, the smallest abortive embryos, when immersed in water, are sustained by the equable pressure of the surrounding fluid, and we can conveniently inspect their structure; but if they are taken out of the water, they collapse into a mucous jelly with-

without any distinguishable figure.

Why upon a sudden discharge, &c.] There is less danger in tapping the thorax, if the lungs be still entire, and capable of being expanded by the air drawn in; because in this case the breast remains still full, the air entering in the same proportion as the water collected between the pleura and the lungs is discharged by tapping. The cautions to be observed in this case were mentioned at §. 1219.

But in the abdomen, unless the flaccid parts are braced by rollers drawn gradually tighter and tighter, all the blood rushes in the vessels now unresisting, the pressure on them being removed; the vessels of the cerebrum and cerebellum are not filled; whence a syncope, and sudden death, may follow; and much more if the vessels are burst. Concerning this, see what was said at §. 1240.

Why dropical patients are so very thirsty, &c.] When so great a quantity of watery serum is collected in the cavities of the body, the blood is deprived of its diluting vehicle, whence the fluids become unfit for circulation; hence arises thirst, which augments when the water grows putrid. See what was said concerning this thirst at §. 1230.

Why acids, &c.] Because they appease thirst, promote urine, and prevent putrefaction.

Why, when a great quantity of water, &c.] Above, at §. 1251. it was shewn, that Sydenham had seen cases, wherein, after the water had been discharged by powerful evacuating remedies, the abdomen was as much swelled as before; but this new swelling was not from a new collection of water, but from wind distending the stomach and intestines. For such spasms sometimes follow the use of strong purges and emetics as contract the intestines, and thus shut up the air within them; which rarefying by long delay is capable of causing wonderful swellings, such as are frequently observed in hysterical women. And such troublesome flatulent swellings also sometimes follow the operation of the paracentesis, and that presently after<sup>a</sup>; but

<sup>a</sup> De Haen Rat. Med. parte iv. p. 80.



but opium happily removes such spasms, and a swelling of this kind soon disappears, as Sydenham also experienced.

Why bandages or rollers, &c.] How necessary the swathing and pressure of the belly is, while the waters are flowing out of the opening made by tapping, has already been observed: but, even after all the water is let out, it is necessary to strengthen and brace the parts distended before, and now flaccid; whence the use of rollers was recommended at §. 28. for strengthening weak and lax parts. When in an anasarca of the thighs and legs, either spontaneously or by art, the water issues through openings of the skin, unless we brace the flaccid integuments of these parts gradually by bandage, there is a danger lest all things should begin to stagnate and a mortification should follow, or a new load of water should be collected in the flaccid parts.

But rollers are only to be used while the water is discharging in the paracentesis of the abdomen, or after it is evacuated in a dropical swelling of the lower limbs: for it is not at all safe to press the swelling parts tight with bandages, with an intention to repel the extravasated fluid; for if we succeed, that which was repelled would almost always occupy the more internal parts. Before, in treating of a dropsy of the chest, we observed, that a sudden swelling of the legs and thighs frequently relieved the oppression on the breast; but that, on the disappearing of this swelling of the lower limbs, the breast was so loaded and straitened, that there seemed danger of instant suffocation. In such a case it is apparent, that rollers would be hurtful.

We observed before, at §. 1229. that a dropical swelling of the feet sometimes came on after long intermitting fevers: and as Sydenham saw that then the fever left the patient, he thought some of the morbid matter was deposited in these parts: wherefore he did not then pursue the treatment proper for the dropsy, to subdue these complaints: but successfully removed them by frictions, and a medicated wine in which bit-  
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ters and aromatics are infused. I have sometimes seen, that, in rheumatic autumnal fevers, towards the end of the disease, when the vis vitæ tired out by the length of the disorder, did not retain sufficient force entirely to expel the conquered enemy, an anasarca of the feet and legs followed, the materia morbi being deposited towards these parts; which it would therefore have been very imprudent to repel by bandage into the internal parts.

END *of the* TWELFTH VOLUME.

















